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Iron Output Breaks All Records

April Tonnage Greatest in Total and Daily Average in History of Country—Iron Ore Demands Expand—Consumption Keeps at Highest Pitch and Situation Continues Tense Despite Reduced Buying

PIG iron production in April maintained its record-breaking stride and was the greatest both in gross tonnage and in daily average in history. The total of coke iron was 3,547,012 tons and the daily average, 118,233 tons. This compares with 3,523,595 tons in March the previous high mark for total output. In daily average the April record was all the more impressive because of the shorter operating period and it was well in excess of the previous high mark, 113,774 tons in September 1918. The list of active furnaces gained 15 over March raising the total to 310 on the last day of April.

The past week's price advances have brought up IRON TRADE REVIEW composite of fourteen leading iron and steel products to $47.70 as against $47.34 one week ago. The composite is now the highest since February, 1921.

Pressure Is Unabated

Reduced buying, perceptibly, has taken none of the pressure for material out of the steel market. The great backlog of tonnage which the mills have built up in recent months is being drawn against by users in a sustained heavy volume as consumption continues at high pitch. Specifications with the larger mills are considerably in excess of shipments so that the active obligations of producers have increased. This has compelled mills in certain lines to continue to decline tonnage except where it can be readily fitted into current operating schedules. Some manufacturers with which the business recovery has been belated, such as the farming implement industry, are finding difficulty in covering for their increased requirements. Under such conditions deliveries have not improved and in some cases are more uncertain.

The pig iron market has remained uneventful and new buying is light. Consumers are pressing heavily for shipments. Prices generally are steady.

Despite some checks here and there, building operations as registered by new structural steel needs are heavy and Chicago reports they have passed all previous records in that territory. This week has seen a heavier total of building steel awards, 28,000 tons, the leading items being 9000 tons for a glass plant at Ottawa, Ill., and 4000 tons for Ford Motor Co. buildings at Iron Mountain, Mich.

Roads' Needs Heavy

Heavy prospective demands from the railroads continue to overhang the market some of which were not in sight until only recently. The check on this buying especially in equipment, is the impossibility of getting delivery on the steel required except for some months distant. The rail market continues to show some stir. The Pennsylvania railroad wants 150,000 tons additional for this year. The Illinois Central has placed a further order for 42,000 tons and the St. Paul one for 40,000 tons with western mills.

Surprise has been occasioned among competing producers at the size of the advance in sheets and tin plate put in effect the past week by the American Sheet & Tin Plate Co. This amounts to $7 per ton in blue annealed, black and full finished automobile sheets, $8 in galvanized sheets and $11 in tin plate. Cold-rolled bars have been advanced $5 per ton but this absorbs a new extra $3 higher made by the bar mills on screw stock.

British makers of ferromanganese have made another advance of $5 per ton, making spot metal $130 tidewater duty paid and for last half, $125. Domestic makers are naming $125 for third quarter.

Ore Demand Grows

Furnaces continue to engage iron ore heavily based on calculations of large future operations. Ore sellers are beginning to foresee some difficulty in filling all demands. It is estimated that 55,000,000 tons already has been covered and the estimate of the season's shipments now has been revised upward to 60,000,000 tons. Ore on hand is considered about 1,000,000 tons below a satisfactory level. The season's vessel rates now have been fixed on the basis of a 10-cent advance from the head of the lakes.

A Charleroi, Belgium mill has sold a tonnage of cotton ties to southern consumers for delivery at Gulf ports. San Francisco buyers have closed for 2500 tons of pig iron from India at $35 c.i.f.

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Waiting Market Rules in Pig Iron

Consumers Still Hold Off from Covering Third Quarter Needs—Pressure for Shipments Is Unabated—Price Irregularities Are Not Extensive—Some Further Basic and Malleable Sold at $31 Valley

PITTSBURGH, May 1.—Third quarter buying of pig iron still is deferred by the majority of users. Several producers report that only about one-third of their output for that period is obligated so that a large flow of tonnage is being dammed up against the early future. Perhaps by May 15 or June 1 the real buying movement for third quarter will get under way which is expected to exceed in point of tonnage the aggregate purchase for the second quarter. Producers of standard pig iron have not departed from the $31, valley, figure, although some high-phosphorus high-silicon basic is offered by one furnace interest at $30. This is not standard basic, however, and these regular basic irons are quotably unchanged at the $31, valley, figure. No interest at all is noted in the open market on basic iron although one middle interest reports the sale of 3000 tons of basic last week to affiliated users; this went at the $31 price. The market at present is peculiar in that it has both elements of weakness and factors of strength. The former are found in the offerings of resale foundry iron by middle interests at $30, valley, and a similar figure named by a scrap iron interest on basic iron which latter quotation is open for negotiation. The chief factor of strength in the situation is the continuing high melting rate and a keen desire manifested by consumers everywhere to receive the iron they have on order. Numbers are anticipating shipping dates. A few single carload sales of bessemer have again been reported this week, all at the $31, valley, price. It now develops that the sale of malleable at that figure reported recently as 1000 tons really involved 3000 tons. One inquiry now is current for 500 tons of malleable from a Canton, O., consumer. No. 2 foundry iron (1.75 to 2.25 silicon) is quotably unchanged at $31, valley. Producers see no reason for forcing the market downward by openly negotiating for tonnage in the present lack of interest by consumers. These latter believe it too early in the second quarter to obligate themselves for third quarter tonnage. The 50-cent differential for each 50 points of silicon prevails although some effort still is made to obtain $1. Some negotiations are under way for low-phosphorus copper-free iron, usually in amounts from 100 to 500 tons. The price still is $36, valley.

April averages of W. P. Snyder & Co. were increased to $31 valley, for both bessemer and basic. This compares with $30.26 for bessemer and $30.02 for basic in March and $28.02 for bessemer and $26.38 for basic in February.

Price Decline Is Halted

Boston, May 1.—The declining pig iron prices of the last few weeks have finally hesitated and careful observers feel that this is the low point in the present downward movement. Sales in New England have as yet failed to improve but dealers report a more pressing desire to speed up shipments on orders already placed. A recent survey of the district indicates that production of castings since the first of the year has been at a heavier rate than arrival of pig iron. Considerable difference of opinion is found concerning the amount of iron which has already been placed for third quarter delivery in New England. Consumption within the district is placed at approximately 50,000 tons a month and the total of such contracts as have come to light for the third quarter delivery scarcely equal this amount or one-third of the required iron for the quarter. Some authorities feel that the delayed deliveries for first half iron, which are now being compensated for by spot buying, eventually will fall into line with third quarter iron and will therefore cut down the buying for that specified delivery. Unquestionably heavy buying for third quarter is still to take place. Furnaces seem reluctant to open their books for fourth quarter, but some fourth quarter business at third quarter prices is being placed. Prices are unchanged from $33.65 to $34.92 for No. 2X (silicon 2.75 to 3.25).

Buying Lull Is Continuing

New York, May 1.—The lull in pig iron buying continues in this district. Comparatively few tonnages have been placed here and new inquiries are of little importance. In fact, the market is much quieter here than in the neighboring territories, New England and Philadelphia. Prices are unchanged. The eastern Pennsylvania and New Jersey makers continue to adhere to the $31 base furnace figure plus $1 silicon differentials. Central Pennsylvania foundry may be regarded as $29 to $29.50 base furnace, plus 50-cent silicon differentials. Buffalo foundry may be quoted at $29 to $29.50 base furnace plus 50-cent differentials. Some resale iron has changed hands at concessions but this business has involved only a slight amount of tonnage and has not been of a character to affect the market. Virginia foundry continues to bring $28.50 to $29 base furnace for second quarter shipment.

Southern Ohio Market Dull

Cincinnati, O., May 1.—Pig iron purchases are lacking in this market. A few sales are being made for prompt shipment. Current demand is principally for fill-in tonnages, but it is somewhat difficult to buy prompt iron, especially in the South. Foundry grades are chiefly wanted. While prices do not display the strength of a few weeks ago, they remain unchanged. Southern iron ranges from $27 to $28, Birmingham base. Only one producer is asking $28 and that is on the higher silicon grades. The southern Ohio market is quoted at $31 to $32, Ironton base. A few third quarter inquiries are before the trade but buyers are doing considerable shopping before they make purchases. Last week business started out very slowly, but toward the end several sales were recorded, involving fairly large tonnages. The Kelsey Wheel Co., Detroit, closed for 625 tons of malleable for third quarter. Other sales include 300 tons of southern iron to a northern Ohio consumer; 160 tons of northern iron to a Columbus, O., melter; 300 tons of southern iron to a southern Indiana consumer and 400 tons of northern iron into southern Michigan. A sale of 100 tons of southern charcoal iron for prompt shipment at $35, base, also is noted. The Crown Pipe & Foundry Co., Jackson, O., is in the market for 1000 tons of northern iron, while James Leffel & Co., Springfield, O., is inquiring for 500 tons of northern iron. Reports received here are to the affect that there is little iron available in the Birmingham district for second quarter shipment.

Some Irregularity Is Shown

Buffalo, May 1.—Some indication of softening is apparent in the quotation of $30.50 being made by one furnace interest on No. 1 (2.75 to 3.25 silicon) but this is partially offset by some sales of 3.25 to 3.75 silicon foundry at $32.50. The base price of $29.50 stands. Inquiry has slackened and sales are lower. The aggregate inquiry for the week was about 4000 to 5000 tons, including one lot of 1800 tons. Makers believe the market will open up more actively shortly. Malleable is being quoted at $30. Fourth quarter inquiry is not active but quotations are on the same basis as third quarter. One furnace interest has 60 to 70 per cent of its third quarter capacity taken.

Market Remains Inactive

Cleveland, May 1.—The pig iron market remains in a waiting state, there being little activity except for small spot lots. The inclination of buyers to defer third quarter purchases now is more pronounced, and sellers are having difficulty in interesting them at present price levels. Consumers are basing their expectations on the steadily receding movement in the coke market, though makers are pointing out other factors. Not much buying is expected until the latter part of the month. One of the largest interests in the northern Ohio group in the past week sold 3500 tons of iron, from all its furnaces; this tonnage including 2000 tons of malleable for a valley user, for third quarter delivery, at $31, valley furnace. The remainder of the tonnage was made up of small prompt lots. The same interest has before it inquiries amounting to several thousand tons. Another maker closed for 2000 tons in small lots during the week, and has around 3000 tons on inquiry. Two northern Ohio consumers who were inquiring for small tonnages for the third quarter a week ago have not closed, while new inquiry

includes 600 tons of foundry iron for a Dayton, O., user and 500 tons for a central Ohio consumer, for third quarter. Spot demand is expected to sustain prices until third quarter buying is resumed on a larger scale. Cleveland users especially have been inquiring for small lots, and a Cleveland furnace that has been sold up, booked a carload of foundry iron for a customer at $32, furnace, this being the first strictly local transaction in some weeks. Another Cleveland buyer bought a carload of higher silicon iron in southern Ohio, paying $32, Ironton, equivalent to $35.03, delivered.

Another lot of 400 tons of foundry iron was purchased by a local melter. The lake furnace price for third quarter still is $31.50; while valley furnaces are offering iron at $31, and Buffalo furnaces, $29.50. These prices also apply on spot transactions where iron is available. A little more activity is noted in the market for standard low phosphorus iron; sales involving tonnages up to 500 tons, on a basis of $36, valley furnace. Users of higher silicon grades have been quoted $37 to $38. The market for basic is inactive. The Hanna Furnace Co. was to relight on May 1 its stack at Detroit that was down for repairs.

Melt Is Holding Up

St. Louis, April 30.—New purchasing of pig iron continues at a low ebb, but all melters having material under contract are urging delivery. The melt is holding at the high levels maintained during March, and early reports indicate a total in April about equal to the record figure of the preceding month. Actual sales are confined to small lots to fill in with and for immediate shipment. While a number of leading users are well covered for the third quarter, there is still considerable tonnage to be purchased for that period, especially if consumption continues at its present rate. Furnaces are well sold up and are not pressing sales. Very little interest is being manifested in fourth quarter requirements. The largest inquiry reported was for 2000 tons of 2.25 to 2.75 per cent silicon by a Pacific coast melter for delivery through the third quarter. An Indiana melter has been asking for 1600 tons of malleable for shipment through the balance of the second and third quarters. Otherwise inquiries in small lots up to 500 tons and aggregating about 4500 tons are before the market. Steelmakers are apparently well supplied for all nearby requirements, no demand from that quarter being looked for during the next six weeks.

Prices on all grades of iron hold firm, though a slightly easier tendency in northern iron is noted. A resale lot on a basis of $29.75 Chicago was reported, and a small tonnage of the same grade was offered at $32. Prices quoted, however, were $32 to $33 for northern and $27 to $28 for No. 2 southern. The leading local producer is quoting $33 to $34, f.o.b. Granite City. This interest is at present working on malleable, but expects to revert to foundry iron early in April.

Present Buying Is Light

Birmingham, Ala., April 30.—The lagging spirit of new buying in the pig iron market in the South indicates another period of activity is close at hand, according to some of the larger producing inter-

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Offer More Distress Coke

Connellsville Ovens Down to $4.55 for Quick Sales—Sizable Furnace Tonnages Moved at $5.50—Only Two Buyers Negotiating

COKE PRICES, PAGE 1275

Pittsburgh, May 1.—Further distress offerings of beehive coke are appearing, due to the fact that production continues in excess of requirements. These offerings vary in price as they vary in analyses. Some Latrobe coke has been sold at $4.55, $4.65 and lower; some high sulphur coke from the southern end of the Connellsville region has sold as low as $3.25 while two carloads of regular Connellsville heating coke were disposed of at $4.50. Fair size quantities of standard Connellsville furnace coke have brought $5.50. The amount of distress coke available has been increased considerably due to several suspensions from furnace operators because of blast furnace operating difficulties. The quotable market, namely $5.50 to $6.50, is unchanged from a week ago. One cargo for export involving in excess of 5000 tons has been collected from various distress offerings at $5.50. One or two coke producers now are offering to accept third quarter coke contracts from domestic blast furnace operators at $6, which is the lowest figure appearing to date on requirement contracts. Others name $6.50, while one or two still are quoting $7. In few instances are negotiations started by coke users. Two of these came to light in the past week. The Inland Steel Co., Chicago, asked for prices on 250 tons of coke per day for three and six months from June 1. A few producers quoted $6.50 ovens, on the June requirements, reserving the privilege of quoting later on a three or six months contract. Witherbee Sherman & Co., Inc., issued an inquiry on 15,000 tons monthly for three months from June 1 for its new furnace. Around $6.50 was named on this tonnage as well as on this interest's smaller blast furnace needs for third quarter, 7500 tons per month. The Struthers Furnace Co. is expected to request resumption of coke shipments some time this month, and should the McKeefrey Iron Co. light up its furnace shortly, as it is expected to do, and one or two other furnaces also resume, the average consuming rate in May will be considerably higher than in April, even should one or two smaller furnaces blow out. This will reduce the over supply considerably and leave less distress coke for the open market, particularly if export shipments are resumed. The resumption of export buying soon is probable owing to the clearing up of the congestion at Atlantic ports, the early removal of embargoes and the reduction of ocean freight rates. Foundry coke is quoted at $7 to $7.50 although producers of certain grades are holding their coke at $8. They are able to obtain that figure only on occasional carloads. Production, according to the *Connellsville Courier*, for the week ended April 21 was 304,870 tons, compared with 306,520 tons in the preceding week.

Coke Sales Decline

Boston, May 1.—With both New England by-product coke producers well sold up for the last half and reluctant to take on additional contracts, trading has declined sharply. Nearly all foundries have covered for their estimated last half requirements. Connellsville coke is offered in New England at prices from 50 cents to $1 below the delivered price for by-product fuel.

Reduces By-Product Coke

New York, May 1.—Coke prices generally are 50 cents lower in this district than a week ago. Standard beehive foundry coke for spot shipment may be quoted at $6.75 to $7.25, Connellsville. On some brands $8 continues to be asked but sales at this figure are exceptional. The Seaboard By-Products Coke Co. has reduced its price on standard by-product foundry coke by 50 cents, effective May 1. The new price is $12.34 to $12.41, delivered at Newark, and other northern New Jersey points. Demand for spot coke has improved somewhat.

Market at Cincinnati Inactive

Cincinnati, May 1.—The coke market is almost at a standstill. Buyers are not interested in the market. Spot Connellsville standard furnace coke has been offered freely and could be bought in some cases at $6, ovens. Some small contracts have been made for foundry coke, but sales generally have been in carlots. A Chicago user has entered the market with a contract for 250 tons of furnace coke a week for the next four months, beginning May 15. This is the most important inquiry that has appeared in the market in the past two weeks. By-product plants continue to ship current output, while a majority of them are sold up for the next two months. A shortage of labor is likely to be felt in the Wise county and New River fields, as many of the workmen have returned to their farms.

Offerings Larger, Market Easier

St. Louis, April 30.—Demand for coke from all sources is quieter and the trend of prices is easier. While the quoted range on Connellsville 72-hour foundry coke is $8 to $9, sales have been made as low as $7.50. Offerings are more plentiful than in several months. Many metallurgical users bought heavily in the recent movement, fearing a scarcity, and at present they are overstocked. By-product plants are operating at capacity and report only moderate accumulations.

Coke in South Still Firm

Birmingham, Ala., April 30—The coke market continues firm though there is some weakness in spot prices. Selling has diminished slightly but there are orders in hand which call for considerable tonnage. The consumption in this district is above the average, and steady production for an indefinite period is assured. The railroads are giving better service in coal and coke transportation, and no delays are noted. By-product coke production is around 100 per cent.

Waiting Market Rules

(*Continued From Page 1273*)

ests here. Very little iron is being sold now but contracts in hand call for steady delivery and the high tonnage output is warranted and will be for several months to come. Quotations continue on a firm base of $27 for No. 2 foundry notwithstanding there is a considerable falling off in the buying. Some inquiries still come from the Middle West. A little iron is being shipped to the Pacific Coast. The output in this district has been increased by an additional blast furnace being blown in. Stove foundries in the South and Middle West have purchased enough iron to last them, it is believed, through the third district.

Chicago Buyers Waiting

Chicago, May 1.—The Chicago pig iron market is quiet but strong. Prices are unchanged at $32, furnace, for the third quarter and $33 for prompt delivery. Sales are noted in 200 and 500 ton lots for May and June delivery. There is little inquiry except for spot lots or for delivery in the second quarter. Selling for the third quarter is on a small scale. Considerable tonnages have already been covered for that delivery, but the largest movement is yet to be developed. Producers desire to delay selling, while buyers believe prices are not likely to go higher and that no haste is needed. Only small stocks of iron are on hand at furnace and foundries and shipments are close to schedule. The unfilled April tonnage is comparatively small. No added production is planned. An inquiry is pending for 100 tons of foundry iron for a Chicago melter. The market for Lake Superior charcoal iron is dull and unchanged. Inquiry for silveries is limited to charcoal lots and the price is unchanged. The market for low phosphorus iron is dull and is quoted $40 to $41, delivered.

Buying Still Small

Philadelphia, May 1.—Pig iron buying continues small here, although some furnaces report better sales of spot and early shipment material. Some slight shading occurs occasionally on secondhand foundry iron, but this is not sufficient to effect the general market here. The market continues firm at $31 base eastern Pennsylvania furnace or foundry plus $1 for silicon differentials. Some low phosphorus copper-bearing iron has been sold at $33 eastern furnace, and more inquiry is pending principally for spot and early shipment. The basic market is uneventful. Several thousand tons of foreign foundry iron has been sold for shipment to the Pacific Coast. Some gray iron has been sold during the past week at concessions.

The second Pottstown, Pa. furnace of the Eastern Steel Co. expects to blow in next week.

The Graton & Knight Mfg. Co., Worcester, Mass., has changed its authorized capital stock from $30,000,000 to $15,000,000 by reducing the par of 600,000 common shares from $25 par to no par value. There are also 150,000 shares of preferred at $100 par.

Urges Investigation of Iron and Steel Costs

Washington, May 1.—Recommendation has been made to the tariff commission by its advisory board for a general investigation of costs in the production of iron and steel here and abroad. This follows a previous suggestion by Paul M. Tyler, member of the board and head of the iron and steel division. The inquiry would go outside any flexible provision of the tariff act and would not involve proposed changes in tariff duties. The pig iron questionnaire now is complete and before the commission for approval, upon which, it will be sent to eastern merchant furnace operators it is understood.

Named General Manager

Philadelphia, May 1.—Banks Hudson has been appointed general manager of Joseph E. Thropp Co. in charge of the Everett and Saxton blast furnaces, coal mines, coke ovens and quarries in Bedford county, Pa. His headquarters will be in Everett, Pa.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	May 2, 1923	April 1923	Feb. 1923	May 1922
PIG IRON				
Bessemer, valley, del., Pitts....	$32.77	32.77	29.57	26.46
Basic valley	31.00	31.00	26.10	24.50
*No. 2 foundry, del. Pittsburgh	32.77	32.77	28.77	25.71
*No. 2 foundry, Chicago	32.50	32.50	29.75	20.00
Lake Superior charcoal, Chicago	36.65	36.55	33.55	26.90
Malleable, valley	31.00	31.00	27.25	24.50
Malleable, Chicago	32.50	32.50	29.75	20.00
*Southern No. 2, Birmingham..	27.00	27.00	24.50	17.60
*Southern Ohio, No. 2, Ironton	31.00	31.00	28.40	22.70
Basic eastern del., eastern Pa..	30.75	30.75	28.15	24.55
**No. 2X, Virginia furnace ...	29.00	29.25	27.50	23.50
**No. 2X, eastern del., Phila..	32.76	32.76	30.10	25.60
Gray forge val., del. Pittsburgh	31.77	31.77	27.87	25.46
Ferromanganese, del. Pitts.	129.79	124.79	112.79	72.32
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	46.00	45.85	39.25	35.00
Sheet bars, open-hearth, Pitts..	46.00	45.85	39.25	35.00
Billets, bessemer, Pittsburgh ...	45.00	46.00	38.85	34.50
Billets, open-hearth, Pittsburgh..	45.00	46.00	38.50	34.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.40	2.35	2.15	1.60
Steel bars, Chicago	2.50	2.43	2.21	1.56
Steel bars, Philadelphia	2.825	2.825	2.525	1.96

	May 2, 1923	April 1923	Feb. 1923	May 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.925	2.875	2.45	1.96
Iron bars, Chicago mills.....	2.60	2.60	2.46	1.58
Beams, Pittsburgh	2.50	2.45	2.15	1.60
Beams, Philadelphia	2.925	2.85	2.525	1.96
Beams, Chicago	2.60	2.53	2.31	1.58
Tank plates, Pittsburgh	2.50	2.45	2.15	1.60
Tank plates, Philadelphia	2.925	2.95	2.525	1.96
Tank plates, Chicago.....	2.60	2.53	2.31	1.58
Sheets, blk., No. 28, Pittsburgh.	3.85c	3.85	3.35	3.15
Sheets, blue anl., No. 10, Pitts.	3.00c	3.15	2.50	2.40
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	4.35	4.15
Wire nails, Pittsburgh.....	3.00	3.00	2.75	2.40
COKE				
Connellsville furnace, ovens	6.00	6.25	7.20	6.00
Connellsville foundry, ovens ...	7.00	7.80	8.60	6.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	23.00	25.85	23.40	17.00
Heavy melting steel, eastern Pa.	22.00	23.50	21.20	15.15
Heavy melting steel, Chicago....	21.50	22.40	19.75	12.05
No. 1 wrought, eastern Pa. ..	22.50	27.00	24.10	17.00
No. 1 wrought, Chicago.....	22.00	22.75	20.50	12.25
Rails for rolling, Chicago.....	23.00	23.65	22.00	12.85

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Composite Market Record by months for Nine Years on Page 1348

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

May 2, 1923	April 25, 1923	April, 1923	February, 1923	May, 1922	May, 1913
$47.70	$47.34	$47.01	$42.61	$36.49	$27.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 1346, WAREHOUSE PAGE, 1338, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1342

Pig Iron

Bessemer, valley	$31.00
Bessemer, Pittsburgh	32.77
Basic, valley	31.00
Basic, Pittsburgh	32.77
Basic, Buffalo	30.50
Basic, del., eastern Pa.	30.50 to 31.00
Malleable, valley	31.00
Malleable, Pittsburgh	32.77
Malleable, Chicago	32.50
Mallebale, Buffalo	30.00
Malleable, del., eastern Pa.	33.00 to 33.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	34.01 to 34.26
No. 1X, Buffalo	30.50 to 31.00
No. 2 foundry valley	31.00
No. 2 foundry, Pittsburgh	32.77
No. 2 foundry, Buffalo	29.50
No. 2 foundry, Chicago	32.50
No. 2 foundry, Granite City	33.00 to 34.00
No. 2 foundry, Ironton fur.	31.00 to 32.00
No. 2 foundry, Cleveland del.	32.15 to 32.75
No. 2 foundry, del. Phila.	31.76 to 32.13
No. 2 foundry, N. J. tidewater	32.13 to 33.28
No. 2X, eastern del., Phila.	32.76 to 33.13
No. 2X, east. N. J., tidewater	33.13 to 33.78
No. 2X, eastern del. Boston	33.65 to 35.15
No. 2X foundry Buffalo fur.	30.00
No. 2X, Buffalo del Boston.	33.92 to 35.42
No. 2 southern, Birmingham	27.00
No. 2 southern, Cincinnati	31.05
No. 2 southern, Chicago	33.01
No. 2 southern, Philadelphia	33.80
No. 2 southern, Cleveland	33.01
No. 2 southern, Boston (rail and water)	34.41 to 34.91
No. 2 southern, St. Louis	32.17
No. 2X, Virginia furnace	29.00 to 29.50
No. 2X, Virginia, Phila.	34.27 to 34.77
No. 2X, Virginia Jersey City	34.54 to 35.04
No. 2X, Virginia, Boston	34.92 to 35.42
Gray forge, eastern Pa.	29.00 to 30.50
Gray forge, val., del. Pitts.	31.77 to 32.27
Low phos., standard, valley	36.00
Low phos., standard, Phila.	35.00 to 37.00
Low phos., Lebanon furnace.	33.00
Charcoal, Birmingham	34.00 to 35.00
Charcoal, Superior, Chicago.	36.65

Silvery Iron

Jackson County Ohio, furnace

8 to 9 per cent	$39.50
9 to 10 per cent	41.50
10 to 11 per cent	43.50
11 to 12 per cent	46.50
12 per cent	48.50
13 per cent	51.00

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$48.50
11 to 12 per cent	51.80

Ferroalloys

Ferromanganese, 78 to 82 per cent, domestic, seaboard or furnace	$125.00 to $130.00
Ferromanganese, delivered, Pittsburgh	129.79 to 134.79
†Ferromanganese, 79 per cent, English, c.i.f. seaboard.	125.00 to 130.00
Spiegel 19 to 21 per cent furnace	38.00 to 42.00
Ferrosilicon, 50 per cent contract freight allowed	95.00 to 97.50
Ferrotungsten standard, per pound contained	90.00 to 95.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	12.00
Ferrovanadium, 30 to 40 per cent per pound estimated, according ton analysis	$3.50 to $4.00

†Duty paid.

Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$5.50 to 6.50
Connellsville foundry	7.00 to 7.50
New River furnace	9.50 to 10.00
New River foundry	13.00 to 14.00
Wise county furnace	7.50
Wise county foundry	8.00 to 8.50
Alabama furnace	7.50 to 8.00
Alabama foundry	8.00 to 8.50

By-Product

Foundry, Newark, N. J., del.	$12.34 to $12.41
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill.	14.00
Foundry, Alabama	8.00 to 8.50

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50 to 47.50
Open-hearth, Youngstown	42.50 to 47.50
Open-hearth, Philadelphia	50.17 to 55.17
Bessemer, Pittsburgh	42.50 to 47.50
Bessemer, Youngstown	42.50 to 47.50
Forging, Pittsburgh	55.00 to 58.00
Forging, Philadelphia	60.17

SHEET BARS

Open-hearth, Youngstown	$42.50 to 47.50
Open-hearth, Youngstown	42.50 to 47.50
Bessemer, Pittsburgh	42.50 to 47.50
Bessemer, Youngstown	42.50 to 47.50

SLABS

Pittsburgh	$42.50 to 47.50
Youngstown	42.50 to 47.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$51.50 to 55.00

SKELP

Grooved skelp, Pittsburgh	2.50c to 2.65c
Universal skelp, Pittsburgh	2.50c to 2.65c
Sheared skelp, Pittsburgh	2.50c to 2.65c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c to 2.65c
Structural shapes, Phila.	2.825c to 2.975c
Structural shapes, New York	2.84c to 2.99c
Structural shapes, Chicago	2.60c to 2.75c
Tank plates, Pittsburgh	2.50c to 2.65c
Tank plates, Philadelphia	2.825c to 2.975c
Tank plates, New York	2.84c to 2.99c
Tank plates, Chicago	2.60c to 2.75c
Bars, soft steel, Pittsburgh	2.40c to 2.65c
Bars, soft steel, Philadelphia	2.725c to 2.925c
Bars, soft steel, New York	2.74c to 2.94c
Bars, soft steel, Chicago	2.50c to 2.75c
Bars, refined iron, Pittsburgh	3.15c to 4.85c
Bars, rail steel, Chicago	2.30c to 2.40c
Reinforcing bars, Pittsburgh	2.30c to 2.90c
Bar iron, common, Phila.	2.925c to 3.025c
Bar iron, common, New York	2.94c to 3.04c
Bar iron, common, Chicago	2.60c to 2.75c
Bars, forging quality Pittsburgh	2.65 to 2.90c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.30c to 3.50c
Hoops, Pittsburgh, small	3.75c to 4.00c
Bands, Pittsburgh	3.30c to 3.50c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.90

Rails, Track Material

Standard bessemer rails, mill	$43.00
Relaying rails, St. Louis	30.00 to 39.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pittsburgh	4.25c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and track bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c to 3.10c
Plain wire, Pittsburgh	2.75c to 3.00c
Annealed wire, Pittsburgh	2.90c to 3.20c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c to 3.60c
Barbed wire, painted, Pitts.	3.55c to 3.70c
Barber wire, galv., Pittsburgh	3.80c to 4.05c
Polished staples, Pittsburgh	3.50c to 3.65c
Galvanized staples, Pittsburgh	3.80c to 4.05c
Coated nails, count keg, Pitts.	2.70c to 2.75c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts	6.25c
Sheet piling base, Pittsburgh	2.55c to 2.70c
Hot rolled strip steel, Pittsburgh stamping quality	3.30c to 3.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	5.25c to 5.50c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.85c to 4.15c
No. 28, bessemer, Pitts.	3.85c to 4.15c
No. 28, open-hearth, Phila.	4.175c to 4.325c
No. 28, open-hearth, Chicago.	4.19c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	3.85c to 4.15c
No. 28, open-hearth, Chicago.	3.84c to 4.34c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c to 5.50c
No. 28 bessemer, Pittsburgh	5.00c to 5.50c
No. 28, open-hearth, Phila.	5.325c to 5.575c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to3.25c
No. 10, bessemer, Pittsburgh	3.00c to 3.25c
No. 10, open-hearth, Phila.	3.325c to 3.575c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c to 7.00c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.00 to $6.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
½ to 3-inch, butt steel	61 to 62	49½ to50½
½ to 1¼-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points More

Steel 3½ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	61.20 to 63.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00
Three-inch, Birmingham	59.00 to 60.00

Class A pipe is $5 higher than Class B.

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Scrap Prices Still Drop

Decline in Quotations Range from 50 Cents to $1 on Many Grades—Consumer Buying Continues Limited—Numerous Railroad Offerings

SCRAP PRICES, PAGE 1346

Chicago, May 1.—Weakness continues to be evident in the iron and steel scrap market at Chicago and further price declines have been made in the week. Heavy melting steel and allied grades are off at least 50 cents from a week ago and cast and other foundry grades $1. Other declines also are noted. Consumers are practically out of the market. Brokers and even large dealers seek to sell, even by forcing the market as a surplus of scrap is coming out, much of it mixed, and a glut impends. It seems likely the bottom has not been reached yet, in view of large offerings by railroads. The Northwestern railroad is said to be on the verge of submitting its list with a large tonnage. The Burlington offers 6000 tons, the Pennsylvania railroad, southwestern region, 6300 tons and northwestern region 3300 tons.

Dealer Trading Improves

Boston, May 1.—Some improvement in scrap iron and steel trading among dealers is noticeable, but other than that the market continued dull throughout the week. Heavy melting steel is still declining in price and Pennsylvania consumers show no disposition to come into this market in the near future. Foundry activity in New England continues to improve and the potential demand for cast grades of scrap is undoubtedly large. Some fairly sizable sales of No. 1 machinery scrap have been reported at $27.50 to $28 delivered, which is practically the same level which has been in effect the past three months. Malleable scrap and railroad wrought are still scarce and in fair demand.

Buying Still Limited

New York, May 1.—Heavy melting and No. 1 railroad steel have again undergone a sharp decline, holding at $17 to $17.50 and $17.50 to $18, New York, respectively. Declines also have been made in stove plate, which is holding at $16.50 to $17, New York, and in wrought pipe, holding at $14 to $14.50. Other grades while unchanged, are manifesting weakness. Slowing up in demand and free offerings of supplies, due in a measure in both cases to a feeling that the market is due for still further declines, are the principal factors in the present easy situation. Some of the leading consumers of heavy melting steel have virtually ceased buying temporarily.

Further Recessions Noted

Pittsburgh, May 1.—Further recessions of 50 cents to $1 a ton are noted in connection with various grades of scrap. This makes heavy melting steel scrap quotable at $23 to $23.50 with other grades priced accordingly. Difficulty is encountered by sellers in finding buyers. They are not forcing the market, however, and many sellers are countering a waiting game with a waiting policy. Occasionally a sale of 100 to 1000 tons is noted but large tonnage movements are rare. Compressed sheets on the Westinghouse Electric & Mfg. Co.'s list brought around $23.40, f.o.b. its plant. Today dealers here are offering $22 to $22.50. Various conjectures are rife with reference to the different railroad lists aggregating in excess of 50,000 tons which are current, including the eastern region, Pennsylvania railroad list, 24,475 tons of assorted grades closing May 3; the Pittsburgh & Lake Erie list of about 50 assorted cars closing today, and lists of the New York Central and other roads closing within the next few days.

Today dealers here are offering to buy steel specialties at $27.50. No demand exists among the users of rails for rolling and the $27 to $27.50 spread is nominal as is the same spread on iron car wheels due to lack of demand.

Weakness Still Is Shown

Buffalo, May 1.—With most commodities on the list at a low demand, the iron and steel scrap market has sagged and may be expected to weaken further. It may be off $2 to $3 per ton unless inquiry improves. Heavy melting steel is down to $24.50; cast scrap is off and blast furnace requirements are all that is holding the market up. Rejections continue in turnings and borings and several dealers are hard hit. Shipments are moving so freely as to cause congestion. Mills are apparently convinced the market is weakening and are awaiting developments.

Consumer Buying Absent

Cleveland, May 1.—Iron and steel scrap prices continue to decline in the Cleveland

(*Continued on Page* 1290)

Higher Prices

Quoted on English Ferro-Manganese —Spiegel Demand Quiet

FERROALLOY PRICES, PAGE 1275

New York, May 1.—Importers received instructions by cable last week to advance their prices on English ferromanganese. The minimum figures now are $130 duty paid tidewater on spot and early shipment and $125 for last half shipment. The supplies for second and third quarter shipment continue limited. Demand is small.

Spiegeleisen demand is very quiet at the moment and very little business substantially has been done during the past week. The market base both on forward and spot requirements may be quoted at $38 to $42 furnace, for 20 per cent metal. While there have been sales recently at figures ranging from $45 to $55 furnace, duty paid tidewater, only a few carloads were involved and these premium prices are not regarded as indicative of the real market.

Some Activity Is Noted

Pittsburgh, May 1.—Sales and inquiries for both ferromanganese and ferrotungsten and some interest in ferrovanadium describe the ferroalloys market. Before the advance of $5 per ton April 26 on ferromanganese by domestic producers, which increased their price to $125, seaboard base, or $129.79 delivered Pittsburgh, several sales were closed including a round tonnage to northern Ohio consumers and three or four others involving 300 to 400 tons each, all for last quarter or for the entire last half. Another group of purchasers includes the Pittsburgh Steel Co., Forged Steel Wheel Co., and the Republic Iron & Steel Co. It is estimated that in excess of 3000 tons has been booked by sellers in this vicinity within the past 10 days. On spot purchases and inquiries for small tonnages for June, $130 seaboard base, applies.

Three or four inquiries are out involving 25,000 pounds on which 95 cents is quoted for prime materials. Recent sales have embraced such amounts as 10,000, 15,000 or 25,000 pounds at a time.

Some interest is manifested in ferrovanadium in small amounts; $3.50 still appears to be the market price. Fifty per cent ferrosilicon, and other alloys are quieter. Spiegeleisen buying for the fourth quarter as yet is deferred.

Domestic producers that last week advanced to $125, seaboard base, or $129.79, delivered Pittsburgh, state this quotation applies to third quarter and is open to negotiation where requirements extend over a longer period. Possibly a slightly lower quo-

Carload Inquiries Pending

Chicago, May 1.—Ferromanganese is quoted at $127.50, seaboard, for the last half, and $130 for prompt delivery. Carload inquiries are pending for July and August. Spiegeleisen is scarce and the demand is good. An occasional carlot of imported material is available at $55 to $58, Chicago.

Manganese Ore Sold

Philadelphia, May 1.—Several small sales of manganese ore have been made at 42 cents to 43 cents c.i.f. tidewater.

Tin Plate Higher

Third Quarter Books Opened by Makers at $11 per Ton Advance

TIN PLATE PRICES, PAGE 1275

Pittsburgh, May 1.—Books of the American Sheet & Tin Plate Co., were opened last Thursday, April 26, for the third quarter only, instead of for the usual six-month period. This action carried an increase of $11 per ton over the preceding level of $4.95 per base box, 100 pounds, Pittsburgh, or $5.50. While in some quarters independent makers expected a $5.75 price and still maintain that level or higher, namely around $6, the $5.50 quotation is generally satisfactory and acceptable in view of the increased production costs with which makers are fixed. Already tonnages for manufacture and shipment during the third quarter have been presented to the American company but because bookings have been so heavy these have had to be refused. They might be accepted now for shipment in the last three months of the year but buyers want the tonnages prior to Sept. 30, hence they are being peddled at an equal basis. As indicated, however, independents still quote $5.75 to $6 and in some cases higher. Lots

involving several hundred thousand base boxes already have been booked with one or two larger tonnages from long-standing customers.

Take Orders at $6

Youngstown, O., May 1.—Independent producers of tin plate in this district are quoting $6 per base box, Pittsburgh and report the entry of business at this figure. A shortage of mill crews is interfering with production at the Canton, O., plant of the Falcon Steel Co. where only six of the nine hot mills are under way.

$5.50 Price Not Followed

New York, May 1.—The American Sheet & Tin Plate Co.'s announcement of $5.50 per base box Pittsburgh as its price on tin plate for the third quarter has not yet been followed by similar action on the part of the independents. In one or two instances it is considered certain that one or two independents will take third quarter business at the same price as the leading interest, but in some cases the makers are disposed to ask higher. Just prior to the American Sheet & Tin Plate Co.'s announcement some third quarter business was taken at $6 by independent makers. There continues to be a firm market on stock list material. Stock material is bringing all the way from $5.25 to $6 per base box Pittsburgh.

Warehouse Steel Demand Continues Heavy

WAREHOUSE PRICES, PAGE 1338

Cleveland, May 1.—Demand for iron and steel out of warehouse continues unabated, and if anything, is increasing in volume. Fifty ton orders are common and still larger tonnages, several involving 100 tons, have been filled. Many orders are being declined due to the lack of material. The leading interest's warehouse here reports its orders in April were 50 per cent larger than those in March, and fully doubled those of February. Prices are firm at the established levels.

Prices Are Advanced

Chicago, May 1.—Local iron and steel jobbers have advanced black and blue annealed sheets $4 a ton to 5.20c base and 4.35c base, respectively, Chicago store, and galvanized $5 a ton to 6.35c base, Chicago warehouse.

Expect Price Advances

New York, May 1.—The month closing yesterday was one of the most active experienced in the local warehouse market. Prices are strong with black and galvanized sheets expected to advance shortly, either $3 or $5 a ton. This is likely to develop in view of higher prices quoted by the leading mill interest.

Demand Continues Active

Philadelphia, May 1.—Jobbers in iron and steel products here continue to report an active demand for their materials. Orders of steel from stock during the past six weeks have been above the average weekly total of 1920. Prices are firm at the levels established April 6.

Semifinished Is Undefined

Sizable Sales of Sheet Bars, Billets and Slabs Are Lacking—Material Still Scarce—Wire Rod Prices Strong

SEMIFINISHED STEEL PRICES, PAGE 1275

Youngstown, O., May 1.—A few consumers of semifinished material are endeavoring to get a line on third quarter sheet bar prices but have not been successful in obtaining a direct statement from manufacturers. The mills here point out that costs of production fluctuate under present conditions and that it is difficult to arrive at a definite figure at this time. Conditions in the semifinished market remain unchanged. Producers have sufficient specifications against sheet bar contracts to make up rolling schedules a few weeks in advance and have little or no free tonnage to offer. No inquiries are current. The last sale of sheet bars reported in this district was negotiated at $45, Youngstown and this figure in all probability could be duplicated if tonnage were available.

Rod Prices Strong

New York, May 1.—Business in wire rods continues to be comprised almost entirely of regular requirements, since the mills have such heavy commitments in finished materials that they do not care to spare any more semifinished tonnage from their mills than is necessary. The American Steel & Wire Co. now is at a minimum figure of $51, base Pittsburgh for rods smaller than ¼ inch while its base price on ¼-inch and larger rods is $53.50. It would be difficult to get rods lower than these figures, while in some cases rods for spot shipment have been sold by independents at $55. Demand for billets here is of small proportions. The market on rerolling billets is regarded as $45 to $50, base Pittsburgh with $45 the minimum quotation on large lots. On open-hearth forging billets the minimum for moderate tonnages is $55, base Pittsburgh, with small sales recently at $57 and $57.50.

No Longer Issuing Inquiries

Pittsburgh, May 1.—Buyers of semifinished material have encountered so much difficulty in locating supplies that they no longer issue formal inquiries in the majority of cases. Whenever the manufacturer or middle interest develops any available tonnage, he immediately makes selection of one of several places he knows are open for its disposal. This creates an apparent lack of inquiry interest in both sheet bars, billets and slabs. A large under-the-surface demand however, still exists since so many conversion mills are short. While some are receiving supplies on old contracts at prices not above $40 or $42.50, others are paying $45, $46 and even $47.50, Pittsburgh or Youngstown, in order to get deliveries. The last sale of sheet bars of size noted here carried a $46 figure but certain producers are maintaining a $47.50 minimum quotation.

One or two users of billets have postponed buying because they cannot locate anything less than that figure in the way of a quotation. Forging billets are quoted at $55 to $58, Pittsburgh or Youngstown, although these prices are nominal in the absence of available tonnage. Wire rods are quoted at $51.50 to $55 although buyers still have difficulty in locating any producer able or willing to take on additional tonnage.

Skelp users, pipe and tubular goods makers having advanced their prices as noted a week ago, are in a somewhat better condition to pay the going market figures on skelp, the minimum of which now is 2.50c, base Pittsburgh. Up to 3.00c is quoted on warehouse stocks.

Eastern Buyers Inquiring

Cleveland, May 1.—Sales of sheet bars, billets or slabs on which to base definite quotations are lacking in this district, and the leading interest has not opened its books for the third quarter. The shortage of steel in some other districts is indicated by the fact that inquiries were received here in the week from points as far distant as New England and eastern Pennsylvania. New inquiry for the three grades amounts to around 10,000 tons.

Billets Sold in East

Philadelphia, May 1.—Several thousand tons of billets were sold in the past week, mainly rerolling quality. The market now is $45 to $47.50, base Pittsburgh, for rerolling billets and $55 for forging.

Strip Inquiry Is Heavy

STRIP PRICES, PAGE 1275

Pittsburgh, May 1.—Inquiries for strip steel, both hot and cold-rolled, are particularly heavy and bookings could be much larger than they are if makers were willing to load up on definite quotations. Their practice for the most part, however, is to name prices prevailing at time of delivery and because they have such heavy order books now the deliveries possible under this scheme are too much deferred for comfort. Cold-rolled strips continue quotable at 5.25c to 5.50c and hot-rolled at 3.30c to 3.50c, base Pittsburgh.

Demand Is Unabated

Youngstown, O., May 1.—Demand for strip steel, but more particularly for the cold-rolled product, continues unabated. Inquiry from the automotive industry is strong. Cold-rolled strip is being quoted by district producers at 5.50c, base, Pittsburgh, but only a limited amount of tonnage is being taken on account of heavy obligations already in hand. The hot-rolled product of stamping quality and 3 inches and wider is quotable at 3.50c, base, Pittsburgh.

The Turner Mfg. Co., Port Washington, Wis., has filed a voluntary petition in bankruptcy. The liabilities are $236,550 and the assets, $363,687 Unsecured claims amount to $206,008 and secured claims, $30,542.

Bar Shipments Desired

Consumers Seeking Early Deliveries of Contracted Material—Buying Continues Heavy Coming from Diversified Lines—Prices Are Strong

BAR PRICES, PAGE 1275

Chicago, May 1.—Every increase in production of steel bars here is fully absorbed in increased consumption and pressure for shipment on contracts continues insistent. Appeals for earlier shipment increase, particularly from railroads and related industries as the season for outdoor work arrives. Buying keeps up well in view of the immense tonnage booked in the past nine months and the extended deliveries now obtaining. At present sales are close to the average for similar periods in the present year. Higher prices have exerted no adverse effect and expected falling off in demand has not been apparent. The impression gains that the present price, 2.50c, Chicago mill, for soft steel bars, probably will make close to the top of the present movement. Under these circumstances many consumers believe it unnecessary to seek further tonnage far into the future and this has helped keep the market from speculative buying. The spread between the leading interest and independent makers has been decreased recently and premium prices are generally lower.

Automobile builders are increasing their production and demand for bars and other forms of steel for that department is increasing. Agricultural implement makers are taking an increasingly hopeful view of the situation and are operating now at bout 75 per cent of capacity, seeking steel bars to maintain that or a better rate.

Bar iron is in good demand at 2.60c, mill, for attractive tonnages. Production now is apparently equal to consumption. Rail steel bars are steady at 2.30c to 2.40c, mill, with strong demand, principally from agricultural implement manufacturers and reinforcing bar users.

$3 Extra Is Charged

Pittsburgh, May 1.—Merchant steel bar makers generally are inaugurating a $3 per ton extra on material furnished to cold-drawn steel bar finishers. This is due to the high labor costs involved in the necessary chipping and inspecting for the quality of material demanded by this class of trade. Demand for bars is as heavy as ever and specifications are freely furnished. Prices are unchanged at 2.40c to 2.65c although in connection with some small lots 2.75c and higher still appears occasionally. The situation in connection with refined iron is unchanged with prices all the way from 3.15c to 4.85c and even 5.00c, depending upon the degree of refinement desired.

Specifications Are Heavy

Cleveland, May 1.—Consumers of steel bars generally are specifying heavily. Manufacturers of automotive parts especially have ordered out considerable additional tonnage in the past week. Agricultural implement manufacturers in this territory find that they have underestimated their needs in their business and have been urging additional tonnage upon the mills but are having great trouble in being accommodated. Actually, however, little new business is stirring in the market and buyers are more inclined to stand on their past purchases. Deliveries are no better and in some respects are worse. Prices are steady at 2.40c, Pittsburgh, as quoted by leading producers.

Price Stiffening Noted

Buffalo, May 1.—Stiffening of the price for merchant steel bars is noticed. The minimum is 2.40c Pittsburgh with 2.50c being quoted widely and as high as 2.75c quoted on prompt tonnage. Inquiry is not brisk but mills have sufficient to keep occupied. Ordinarily delivery is still three to four months deferred.

Cold-Drawn Advances $5

Pittsburgh, May 1.—Cold-drawn steel bars were advanced yesterday $5 a ton from 3.00c to 3.25c, base Pittsburgh. The less-than carload price now is 3.50c. Because, however, hot-rolled merchant steel bar manufacturers have inaugurated an extra of $3 per ton for bars for cold-finishing purposes, this increase actually is but $2 per ton. The $3 extra referred to which has not been charged for several years, is resumed by the merchant bar makers because of the high costs of producing bars for cold-drawing, including shipping, inspecting, etc. Commitments of the cold finishers are heavy and while the bulk of the needs of the automotive industry, judging from the March specifications, have been met, some orders still are coming in from that trade while other lines of consumption likewise are active in furnishing specifications. Operations are on about an 80 per cent average. The going business is desirable from both tonnage and rolling standpoints.

Bolt, Nut and Rivet Order Volume Still Heavy

NUT AND BOLT PRICES, PAGE 1342

Chicago, May 1.—In spite of the heavy contracting for second quarter supplies of bolts and nuts which seemed to have covered most users for that delivery current spot lots continue to come out and supplement tonnages already on mill books. The result is that producers are busy and prices are being maintained strongly at the discounts announced some time ago.

Order Books Heavy

Pittsburgh, May 1.—Business in nuts, bolts and rivets is in good shape owing to the large amount of material on order books. Consumers who had contracts for the first quarter, bought all they could under those contracts and were well stocked up as they faced the second quarter. Many of them still are running upon these stocks. The new prices are holding strong and while there has been some shading in connection with rivets due to keen competition for the tonnage offered, the 3.25c and 3.50c, base Pittsburgh, prices on structural and boiler rivets, respectively, are firmer as May is entered than they were during the middle of April.

Demand Is Unchanged

Cleveland, May 1.—No appreciable change is shown in demand for bolts, nuts and rivets in this district. Producers report specifications against contracts are heavy and new business being booked is in satisfactory volume. The only trouble appears to be that caused through a shortage of labor. Prices are firm at the recently announced levels.

Hoop Commitments Heavy

HOOP PRICES, PAGE 1275

Pittsburgh, May 1.—Order books of the hoop and band makers are in good shape for some time to come, all makers having heavy commitments. Occasionally new orders are placed for fair sized tonnages but consumers largely have protected themselves on their needs for some time to come, some at prices prevailing at time of delivery; others are 3.30c to 3.50c, base Pittsburgh. Small sizes still are quoted at 3.75c to 4.00c.

Europe Not in Market for American Iron

New York, May 1.—Ralph W. Clark, manager of the New York pig iron department for Pilling & Co., who has returned from a trip to Europe, says he did not see any indications of an immediate demand for American pig iron for shipment to Europe. In some quarters in this country it had been believed that the French interests who only recently bought large tonnages of American furnace coke at prices aggregating $19 to $20 a ton delivered at their plants, might be induced to buy American pig iron instead. Mr. Clark found that pig iron business could not be obtained abroad on the basis of the coke cost by reason of the fact that the high prices paid for American coke do not determine the final costs at any of the French furnaces. Through the Societe des Cokes de Haut Fourneaux which operates under the supervision of the French government, prices are equalized on all the coke brought into France. This includes not only the American coke, but also English, Belgian and Czecho-Slovakian, and the reparations coke brought in from Germany. It is understood that the prices paid for this coke are averaged and the blast furnaces which consume the coke are billed on this basis. As a result, it was impossible to interest any of the French concerns in buying American pig iron.

Mr. Clark says that English furnaces generally are sold up to the middle of June and a large part of the output until then will go to the Continent. He believes that if any considerable demand accumulates in the continental consuming districts before the middle of June, some business might be placed here. Unless there is

such an emergency it is unlikely that the United States can look for many orders from Europe, unless English prices advance materially and prices on this side decline. Mr. Clark thinks English prices are going to continue very strong.

Buys Sheffield Stack

Birmingham, Ala., May 1.—Repairs of the blast furnace of the Sheffield Iron Corp. at Sheffield, Ala. already have been put under way by the Sloss-Sheffield Steel & Iron Co. which purchased this property Monday. The Sloss-Sheffield company has assumed the bonded indebtedness of the Sheffield Iron Corp. of $585,000 of 6 per cent 50-year bonds and in addition paid $265,000 for the furnace. The Sheffield furnace has an annual capacity of 90,000 tons. The properties of the Sheffield Iron Corp. also includes iron ore mines at Russellville, Ind. and West Point, Tenn. and a beehive coke plant at Jasper, Ala.

Materials Firm Formed

J. C. Agnew, formerly assistant to the president of the Midvale Steel & Ordnance Co., in charge of raw materials and pig iron sales, and his associate, R. L. Batteiger, have engaged in business as Agnew, Batteiger & Co., as merchants in coal, coke, ores, alloys, fluxes, pig iron, scrap and kindred materials with offices in the Widener building, Philadelphia. The firm has been incorporated.

To Enlarge Boiler Plant

The stockholders of the Heine Boiler Co. St. Louis, have authorized additions to its plant which will cost approximately $500,000 and will make possible the building of much larger boilers than heretofore. The additions will be in the form of enlarged buildings and new machinery for turning out boilers of 2000 horsepower. The new equipment will include the largest bending roll of its kind in this country and a new multiple drill for use on thick material.

Pig Iron Dealers Merge

New York, May 1.—J. G. Miller & Co. and Carson & Co. have been consolidated as Miller, Carson & Co., with offices in the Pennsylvania building, Philadelphia. The company handles pig iron, coke and alloys and it has taken over the Hastings Coal & Coke Co.

Buys Wabana Ore

Philadelphia, May 1.—The sale of 50,000 tons of Wabana, Newfoundland iron ore to eastern Pennsylvania furnace has been made by Pilling & Co., sales agents here.

Iron Imports Continue

Philadelphia, May 1.—Imports at this port in the week ending April 28 included 148 tons of ferrosilicon from Sweden, 1200 tons of pig iron from England 100 tons of ferromanganese from England.

Plate Prices Stabilizing

Spread in Eastern Territory Narrows to 2.50c to 2.65c—New Jersey Central Seeks 14,000 Tons—Large Tank Jobs Appear at Chicago

PLATE PRICES, PAGE 1275

Philadelphia, May 1.—Plate demand is fair, better than a week ago and somewhat larger. A portion of current inquiry is coming from the East. The most notable development is the less frequent occurrence of the 2.75c, Pittsburgh, price on early shipment. This price now seems limited to occasional small tonnages for shipment in two or three weeks. Nearly all early tonnage now is bringing 2.60c to 2.65c, Pittsburgh. This appears to be due not only to a smaller volume of demand but also to a tendency on the part of larger makers to stabilize the price at 2.50c Pittsburgh. The latter price applies principally to shipment at mills' convenience, which in some cases means a considerable period ahead. The largest inquiry here is for 13,000 to 14,000 tons of plates for the proposed Central railroad of New Jersey bridge across Newark bay. There also is some interest in 2300 tons for the Flushing route No. 52 on which the New York transit commission is taking bids. The Pennsylvania railroad is for 2000 to 5000 tons of plates.

Prices Are More Stabilized

Cleveland, May 1.—Prices on plates appear to be more stabilized and there is not so much pressure in evidence in the market as recently but a nice volume of business is continuing. Most of the mills are continuing the policy of not seeking additional business. The largest producer and two or three of the leading independents are quoting 2.50c, Pittsburgh, but only for prolonged or indefinite delivery. Eastern mills who have been making it a point of taking early shipment tonnage at advanced prices are unable to accommodate all the demands upon them and are rejecting a great deal of business especially that coming from other than regular customers. Their quotations run from 2.80c to 3.00c, mill. A new inquiry for 20 oil stills of the Standard Oil type involving 700 tons has appeared in the market within the past few days.

Eastern Demand Falls Off

New York, May 1.—The eastern mills in a number of instances have taken plate tonnages during the past week for early shipment at 2.60c, base Pittsburgh. Small tonnages for early shipment continue to be booked now and then at 2.75c. The leading interest and large independents continue to maintain 2.50c as their minimum figure. Demand for plates has fallen off considerably in volume in this territory and very few large tonnages are outstanding.

Oil Tank Work Appears

Chicago, May 1.—Plate demand is more in evidence as some additional oil tank work appears. The Magnolia Petroleum Co., Dallas, Tex., is asking bids on 10 units which will require 5000 tons of steel plates. The Roxana Petroleum Co. has awarded the United Iron Works, Kansas City, a small lot of tanks. Plates are quoted for indefinite delivery at 2.60c, Chicago mill, while some prompt plates are going in small lots at 2.75c, Chicago. Demand for plates for car building continues heavy on former commitments and mills are making every effort to meet requirements.

Capacity All Occupied

Pittsburgh, May 1.—Inquiries for tankage appear from time to time involving small lots of 200 to 300 tons each. Occasionally a larger tonnage, such as the one now current, 4000 or 5000 tons, is put into circulation. This particular one in which several fabricators are reported to be interested is for several 68,000-barrel tanks. All excess plate capacity of the country now appears to be occupied to the extent permitted by an 80 to 90 per cent operating average and promises to continue in that condition for some months. The market is unchanged on the basis of 2.50c to 2.65c, base Pittsburgh, although occasionally higher figures prevail where early deliveries are possible.

Suggests Settlement of German Reparations

New Orleans, La., May 1.—A specific suggestion looking to the solution of the reparations question was advanced in a report to be submitted by a special committee of the National Foreign Trade council to the first general session on European conditions of the tenth national foreign trade convention in this city, Wednesday afternoon. The question was raised whether Germany might not be able to pay without detriment to its creditors, 50,000,000,000 gold marks, on terms similar to those of the British debt settlement. This would require annual payments on principal running from about $50,000,000 the first year to about $525,000,000 for the 62nd year, and this, the report considers possible without undue menace to the trade of the various allied nations in the war.

The report cites that Europe bought from the United States last year, and sold to the United States, more than any other continent, despite all its industrial and political difficulties.

"For the five years prior to the war," the report stated, "Europe annually sold to the United States more than twice as much as any other continent, and bought from the United States from three to five times as much as any other continent. Since the close of the war our balance of trade has declined at the rate of $1,000,000,000 a year; hence the relation of a stabilized Europe to the prosperity and welfare of the United States and to the permanent and sound development of our foreign trade is so apparent as to need no argument. It is by no means beyond the bounds of possibility that Germany should develop an export trade of $2,000,000,000 and more a year without serious menace to the trade of other nations."

The convention was in session May 2, 3 and 4.

Lull in Concrete Demand

General Falling Off in Lettings Reflects Inactivity of New Work in Recent Weeks—Prices Continue Strong

REINFORCING BAR PRICES, PAGE 1275

Cleveland, May 1.—With no large lettings and few small jobs being placed during the past week the reinforcing bar demand slumped off considerably compared with previous weeks. Although plenty of business is in prospect, inquiries for specific projects are fewer. The shortage of labor at the mills and the fact that the mills are well booked in the future maintains prices strong at 2.50c, base mill, on rail steel bars, and 2.40c, base Pittsburgh on new steel. Buying continues fairly heavy out of stock at 2.90c.

Majority of Projects Small

Pittsburgh, May 1.—The majority of concrete bar projects now up attention locally, such as the addition to the Syria Mosque temple, the freight house for the Baltimore & Ohio railroad, the David B. Oliver high school, Brighton road, the Carnegie Tech gymnasium, etc., all require small tonnages from one to two carloads each. The Vang Construction Co. is low bidder on the Bellevue, Pa., bridge, 350 tons, which will be let this week. A bridge at New Castle, Pa., may require about 150 tons and a power house at Toronto, O., a larger tonnage. Prices usually run from 2.40c to 2.75c, base Pittsburgh, although occasionally a 2.30c quotation is heard while up to 2.90c is quoted on bars delivered from warehouse stocks.

Prices Are Advanced $3

Chicago, May 1.—Following another advance in local mill prices, concrete bars have advanced $3 a ton to 3.15c Chicago warehouse. There was considerable pressure to buy on the eve of the advance and lettings for the week total rather large in spite of the fact that some dealers are cautious about adding to their commitments. Deliveries of steel from the mills still are far behind schedule, but sellers see possibilities of a slowing up in building work, particularly in Chicago. A number of new hotel and apartment house projects have been indefinitely postponed because bankers are unwilling to float further bond issues covering that character of work at this time. The Fair Store addition, Chicago, bids on the general contract of which were taken May 1, will involve 700 tons of bars instead of 400 tons as previously reported.

CONCRETE CONTRACTS PLACED

300 tons, Cook Estate hotel, Omaha, Nebr., to Concrete Steel Co.
300 tons, club building, 1244 North Dearborn street, Chicago, to Corrugated Bar Co.
300 tons, Champaign county, Ill., road work, to Truscon Steel Co.
300 tons, Shafer Block, Seattle, to Pacific Coast Steel Co.
250 tons, plant addition for Gossard Corset Co., Chicago, to Kalman Steel Co.
250 tons, L. & A. Textile Co. plant addition, Kenosha, Wis., to Concrete Steel Co.
200 tons, Green Bay high school, to Kalman Steel Co.
200 tons, Hotel La Salle Garage, Chicago, to Joseph T. Ryerson & Son.
150 tons, Illinois road work, to Kalman Steel Co.
100 tons, La Crosse Plumbing & Supply Co. building, La Crosse, Wis., to Kalman Steel Co.
100 tons, Wisconsin road work, to Kalman Steel Co.
100 tons, Illinois road work, to Truscon Steel Co.
100 tons, building for Gilman Paper Co., Gilman, Vt., to Truscon Steel Co.
100 tons, Amburson Construction Co., New York, to Truscon Steel Co.

CONCRETE CONTRACTS PENDING

1000 tons, stadium, Terre Haute, Ind.; bids asked.
700 tons, addition to Fair Store, Chicago, bids on general contract in. Previously listed as 400 tons.
500 tons, Blayney Murphy Packing Co., packing house for Denver, Colo.
300 tons, power house at Toronto, O., for Pennsylvania-Ohio Electric Co., subsidiary of the Republic Railway & Light Co., New York, bids being taken.
175 tons, building for International Harvester Co., Cleveland; indefinitely postponed.
100 tons, 9-Mile Run creek, culvert, Wilkinsburg, Pa.; bids close May 14.
100 tons, addition to Syria Mosque temple, Pittsburgh; bids being taken.
100 tons, Baltimore & Ohio railroad freight house, Pittsburgh; bids being taken.
100 tons, gymnasium for Carnegie Institute of Technology, Pittsburgh; bids in.
100 tons, David B. Oliver high school, Brighton road, Pittsburgh; bids being taken.

Order Books

Of Pipe Mills Heavily Loaded—Much New Tonnage Is Declined

PIPE PRICES, PAGE 1275 AND 1342

Pittsburgh, May 1.—Pipe makers generally entered May with splendid order books. These are said to be fairly evenly divided between lapweld and buttweld although the former of course involves the greater aggregate tonnage. Jobbers everywhere are trying to add to the tonnage they have coming and this is particularly true of line pipe and oil country goods jobbers supplying the demand in the southwestern and western oil territories. Many thousands of tons of pipe business are being turned down each week by all makers although it is possible this is larger than really is the case on account of being repeatedly offered. The new cards of April 19 are holding firm, the base size being quoted at 61 off on black and 49½ off on galvanized.

Little Municipal Demand

New York, May 1.—Bids have been closed on more than 600 tons of bell and spigot, class A pipe for Jersey City, N. J. Approximately 70 tons of flanges were included. A lot of 600 tons of 20-inch pipe for Fitchburg, Mass., has been awarded to the Warren Foundry & Pipe Co. Little else in the way of municipal demand is noted with the market generally less active than a fortnight ago. Undoubtedly, extended deliveries are an important factor in this development. Prices are strong, but unchanged.

Selling Is Limited

Chicago, May 1.—Many producers of cast iron pipe are not bidding on projects requiring tonnage of this material, reserving their capacity for their regular customers who look to them for their requirements. As a result the number of bids on most lettings are less than usual. Quotations range from $50 to $51, Birmingham base, and business must be attractive to command these prices. The National Cast Iron Pipe Co. has been awarded 300 tons at Altamont, Ill., the United States Cast Iron Pipe & Foundry Co., 700 tons at Jackson, Mich., and James B. Clow & Son, 500 tons at Grand Rapids, Mich.

Heavy Demand Continues

Birmingham, Ala., April 30.—Several cast iron pipe plants in this district, working on pressure pipe are working from under an avalanche of business. However, it will be some time before the business will be cleared. An advance in pressure pipe prices this month did not disturb the market. Milwaukee has placed 500 tons and two or three cities in Illinois also closed with the United States Cast Iron Pipe & Foundry Co. orders ranging from 135 to 500 tons.

The production of pressure pipe is heavy. Several specifications are still in hand and additional business assured. The Middle West and Northwest still are in need of pipe. Shipments to the West, through California and Washington ports continue brisk. Cuba is taking some pipe from this district.

More Price Advances

Are Expected on Wire and Nails—Demand Continues Heavy

WIRE PRICES, PAGE 1275

Pittsburgh, May 1.—The report wire products will again advance gains credence and while producers have not announced what this will be, it is understood that wire will go to 2.85c or 2.90c and wire nails to 3.10 or 3.15c, base Pittsburgh. The Cambria Steel division of the Bethlehem Steel Co., which has been quoting 3.00c and 3.10c on wire and wire nails, respectively, for some time past, continues to report the booking of various fair sized orders particularly for nails on those bases; its price on cement-coated nails is 2.75c but it is filled up for six or seven months to come. Other makers of cement-coated nails are naming 2.70c per count keg. Wire products makers continue to have difficulty in forestalling the efforts of their jobbers and customers to add to the tonnage they have coming to them or to place orders for fresh lots. They are booked for two or three months to come and the present operating average of around 80 per cent promises to continue indefinitely.

Prices Rise to New Level

Chicago, May 1.—Advances on wire and nails by the leading producer have brought the market to the level maintained recently by independent makers. Demand continues strong and production inadequate. A further advance by independent makers may follow, though most observers believe the top has been reached. Efforts are being directed principally to reducing commitments and new business is being taken carefully, with full regard to present contracts on books.

Nail Minimum Raised

New York, May 1.—Prices on nails were advanced by the leading interest on Saturday, to 3.00c base Pittsburgh and this figure now generally is the minimum. At the same time the price on plain wire was advanced to 2.75 base Pittsburgh and this also

is now the minimum figure. Producers report a slowing up in the demand for nails and wire. This is true particularly in the South where shipments were not so handicapped by embargoes during the winter and where stocks are in much better condition. There also is a slowing up through the East generally, but this has not yet been of sufficiently long duration to show whether or not it is of a temporary character. In the meantime the decrease in demand has not had any effect on conditions by reason of the fact the mills continue far behind in their schedules. Mills report unusually small buying by the farmers so far this year, with the result sales of fencing are below the average.

Ore Shippers Continue To Book Tonnages

ORE PRICES, PAGE 1342

Cleveland, May 1.—Indications of a very large movement of iron ore this year from the Lake Superior district exist. One of the largest producers this week has booked 125,000 tons additional in the open market and now has orders in hand for a total within 200,000 tons of its largest year's shipment. It is evident that furnaces are preparing for a long period of unusual activity, and with the majority of ore producers heavily sold there is some uneasiness on their part in obtaining necessary vessel tonnage. A shipper with a large fleet has more than its full capacity taken up.

Most of the blast furnaces have covered their ore requirements, and all the large steelmaking interests with mining company connections have specified fully. Reports indicate that the tonnage of ore at lower lake docks and furnaces on May 1 will amount to about 19,000,000 tons, or around 1,000,000 below the usual average for an active year. Furnaces have been consuming ore at a record rate. It is said in some quarters that 55,000,000 tons of ore is now covered, and new estimates of the tonnage to be moved this year run as high as 60,000,000 tons.

Ice in the upper lakes still is holding back actual shipments but an early start is to be made from Escanaba. Vessel rates have been placed at 72 cents from Marquette and 60 cents from Escanaba to Lake Erie ports and at 48 cents from Escanaba to South Chicago, these representing increases in proportion to that made a week ago when the rate from the head of Lake Superior to lower lakes was fixed at 80 cents, an advance of 10 cents. An effort is being made by ore shippers to have the effective date advanced from June 11 on the interstate commerce commission's order for a reduction in line hauls from mines in Michigan and Wisconsin to upper lake docks. The shippers would like to have the rates reduced immediately.

Furnaces Are Replaced

Replacement of the original sheet and pair furnaces with later type sheet and bar heating furnaces now is being effected in turn at the plant of the Mahoning Valley Steel Co., Niles, O. This week, therefore, but seven of the eight sheet mills of this company are scheduled on production.

Sheets Selling at Advance

Leading Interest Raises Prices $7 on Blue Annealed and Black, $8 on Galvanized, for Third Quarter—Demand Continues Strong

SHEET PRICES, PAGE 1275

Pittsburgh, May 1.—The response of sheet buyers to the announcement of higher prices made by the American Sheet & Tin Plate Co., simultaneous with the opening of its books for the third quarter, has been more prompt and extensive than was anticipated. Fairly sizable specifications already have come in at the new prices, which as issued April 26 are $7 to $8 per ton higher than those prevailing since the announcement for the second quarter. The advance is $7 on blue annealed, black and full-finished automobile sheets, and $8 on galvanized. Increased production costs are given as the reason for the new levels which are 3.00c on blue annealed, 3.85c on black, 5.00c on galvanized, and 5.35c on full-finished automobile sheets, all base Pittsburgh. While one or two independent producers are understood to have adjusted their prices to conform with these levels, others are maintaining minimums of 3.25c on blue annealed, 4.00c on black, 5.25c to 5.50c on galvanized, and 5.50c to 7.00c on full-finished. The American company's prices prevailing prior to April 26 were 2.65c, 3.50c, 4.60c and 5.00c, base Pittsburgh, respectively. The leading producer reports that numerous contracts for third quarter tonnage already have been placed with it by customers requiring 1000 to 5000 tons at a time over the quarter. One for blue annealed received yesterday calls for 2300 tons for small bolted oil storage tanks, usually of 1000 to 10,000-gallon capacity. Galvanized sheet tonnage is heavy and could be much larger if the American company had room for all it is offered. These offerings are more extensive than usual due to the fact that four or five independent makers have ceased manufacturing for the time being and others are operating on a low basis. The American company is able to accept only about 60 per cent of normal bookings on this grade. Those galvanizing departments which are active only are able to operate 35 to 45 per cent of capacity due to shortage of pickling labor. Sizable tonnages of full-finished automobile sheets are being placed from week to week in sufficient quantities to assure present high automobile production for five to six months.

Market Is Less Active

Youngstown, O., May 1.—Much of the buoyancy has disappeared from the sheet market although there still exists a fairly good volume of inquiries. The scramble for tonnage is lacking, however, and the volume of business being booked at present indicates that consumers are becoming more conservative. Prices of common sheets in this district show a wide spread. In the case of blue annealed the spread is $10 a ton, with consumers being quoted 3.00c to 3.25c and 3.50c by mills where tonnage is available. One mill in this district which a week ago was taking black tonnage at 3.75c, base Pittsburgh, brought its price up $2 a ton last Thursday to conform to that now quoted by the Steel corporation. While this producer is not taking on large tonnages of black at 3.85c yet the quantity of business which it is accepting makes it a factor in the market. Other makers of black sheets are quoting 4.00c and 4.25c, Pittsburgh. Galvanized sheets are obtainable here at prices ranging from 5.00c to 5.50c but the volume of free tonnage is not large.

Fine finished sheets are quoted at 5.35c, Pittsburgh, by district producers and no deviation from this figure is contemplated by them in view of the conservative policy which they adopted. On the other hand, consumers of high-grade sheets in the Detroit district have been informed by some mills that a price of 5.75c for No. 22 fine finished stock is not unlikely before this quarter ends. Close followers of this branch of the sheet market are of the opinion that an advance of $10 a ton on automobile sheets at this time is too extreme in view of the fact that many automobile manufacturers now are confronted with a scarcity of parts, motors and glass.

Demand Less Urgent

New York, May 1.—Sheet demand has decreased considerably in volume in this territory. Some of the premiums which recently were being asked by certain mills for nearby shipments have disappeared. The market situation, however, is very strong by reason of the large amount of business on mill books and the difficulty of getting material for nearby delivery. As a result of the leading interest's advance last week 3.00c base Pittsburgh for blue annealed; 3.85c for black and 5.00c for galvanized, these figures now are the market minimum. As a rule independents quote higher figures.

New Prices Conservative

Chicago, May 1.—Prices announced last week by the leading producer of steel sheets are considered conservative for third quarter delivery, as they are somewhat below the premiums prevailing recently. Those of black sheets are under the level generally expected. The Inland Steel Co. has not yet allocated its third quarter tonnage or announced its price policy. Production is reduced somewhat, owing to the tendency of rollers to lay off.

Higher Prices Disappearing

Philadelphia, May 1.—New sheet demand is slower, but contract specifications continue heavy. Therefore, buyers continue to have difficulty in obtaining early deliveries. In some cases they are offering premiums for small spot lots. The effect of the Steel corporaton's price advance has not been fully analyzed by independents and some of them have not decided what they will quote. Some of the high prices recently quoted have disappeared and the present market is 3.00c to 3.25c, base Pittsburgh, for blue annealed; 3.85c for black, while galvanized is difficult to buy from independents under 5.25c.

Shape Lettings Heavier

Prices Stiffer Generally Although Inquiry Falls Off—Raw Material Market Stronger— Building Passing All Records in Chicago

STRUCTURAL SHAPE PRICES, PAGE 1275

New York, May 1.—Structural buying here continues somewhat slower than it was a fortnight ago, and as the mills work off much of the heavier tonnage placed earlier in the year, deliveries are getting slightly easier. These for the most part represent tonnages needed in filling up small gaps which arise from time to time in schedules, with the result that some of the earlier shipments now reported as being placed without premiums are not truly representative of the situation. Shapes continues steady at around 2.50c to 2.60c, Pittsburgh, with premiums for nearby ranging up to 2.85c, mill base. In the fabricated steel market, however, with practically all shops in this district well booked, around three and three and a half months, prices continue to stiffen. Until recently the fact that two or three fabricators were still not comfortably booked served to check the movement in prices on fabricated material.

Price Has Stiffened

Buffalo, May 1.—The demand for structural shapes is quieter, but the price has stiffened, and 2.60c base Pittsburgh, is now being quoted by a local mill.

Demand Increasing in East

Philadelphia, May 1.—Structural shape demands were stronger during the past week than the week previous although smaller than preceding weeks. The feature of the market was the increasing portion of business coming from the East where much fill in tonnage is wanted for structural work. The most interesting inquiry now in the market is that for the requirements of the New Jersey Central railroad Newark bay bridge. One item involved in this project is 4000 tons of 8 x 8 inch angles in 124 foot lengths. Most mills are unable to furnish such lengths. Continued good demand from the Pacific Coast is reported by the mills. Eastern makers continue to quote 2.85c, base mill, as minimum for early shipment, with some business at 3.00c. These makers are conserving their output in order to be able to take prompt business. The larger mills are quoting 2.50c base Pittsburgh, on shipment at the mills' convenience. The Pennsylvania railroad is inquiring for third quarter shapes.

Small Inquiries Continue

Cleveland, May 1.—With no lettings of size during the past week, and few inquiries involving considerable tonnage, the lull in the structural shape market continues unabated. Prospective business is expected to to involve considerable tonnage, with many local fabricators looking for a much heavier demand before the end of the month. The outstanding letting of the week is the placing of 4000 tons to Worden-Allen Co., for the Iron Mountain, Mich., plants of the Ford Motor Co. The Cleveland public library, which has been under consideration for quite some time past, will be brought up for bids on May 28. Some eastern mills are quoting 2.85c to 3.00c, base mill, for quick deliveries. The leading eastern mill is offering standard shapes at 2.50c, base Pittsburgh.

Building Passes All Records

Chicago, May 1.—Building operations are passing all previous records and the requirements of steel for this purpose are heavy and increasing. Mill prices on plain material continue at 2.60c, Chicago mill, for material to be delivered at mill convenience, while as high as 2.75c Chicago, has been done on small prompt lots or over-specification. The latter figure seems likely to prevail on some tonnage for third quarter. Lettings of important size continue to be made and fabricators have no trouble in finding as much business as they can handle for which they can obtain mill tonnage. Inland Steel Co. has not yet divided its third quarter tonnage or announced its price.

Bridge Involves 1500 Tons

Pittsburgh, May 1.—One of the largest structural shape jobs before fabricators for bids just now is the Mahoning avenue-Moravia street bridge, New Castle, Pa. Bids will close on this May 15-16; it involves about 1500 tons. Awards lately have been confined to relatively unimportant tonnages. Two church buildings are being projected for Pittsburgh which will require between 3000 and 5000 tons of steel but these are in the formative stage, one at Smithfield street and Sixth avenue, and the other at Smithfield street and Seventh avenue. Steel mills all are active on a 90 per cent operating basis, although the fabricating shops have difficulty in attaining an average of more than 80 per cent. Competition still is keen on material fabricated and erected although the raw material market is stronger upon the basis of 2.50c to 2.65c, base Pittsburgh.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 27,940 tons
Building awards last week ..... 16,594 tons
Building awards two weeks ago.... 23,199 tons

9000 tons, plant at Ottawa, Ill., for National Plate Glass Co., to Mississippi Valley Structural Steel Co.
4000 tons, extensions body plant and other buildings for the Ford Motor Co. at Iron Mountain, Mich., to Worden-Allen Co.
3500 tons, Elks' home, Philadelphia, to New York Shipbuilding Co.
3000 tons, schools No. 66 and No. 67, each involving 1500 tons, New York, to A. E. Norton, Inc.
1213 tons, bridge work in Missouri for Missouri state highway commission, to Vincennes Bridge Co., St. Louis Structural Steel Co. and Pittsburgh-Des Moines Steel Co.
1000 tons, Cosmopolitan theater building, Washington, to New York Shipbuilding Co.
1000 tons, signal towers for Norfolk & Western, placed through Gibbs & Hill, Pennsylvania terminal, New York, with unnamed fabricator.
1000 tons, building for National Biscuit Co., Buffalo, to American Bridge Co.
850 tons, school No. 160, New York, to Harris Structural Steel Co.
400 tons, Marion station of Public Service Corp of New Jersey, Newark, to Hay Foundry & Iron Works.
400 tons, building for Oxford Paper Co., Rumford Falls, Me., to Megquier & Jones Co.
400 tons, highway bridge, Johnstown, Pa., to American Bridge Co.
400 tons, apartment 108 East Eighty-sixth street, New York, to Harris Structural Steel Co.
322 tons, miscellaneous bridges for the Northern Pacific railroad, 97 tons, to Milwaukee Bridge Co., 225 tons to unknown fabricator.
270 tons, building for copper rod and wire mill for Brenner, Moxley & Mervis Co., Chicago, to A. Bolter's & Sons.
242 tons, 100-foot lift span bridge at Osage, Mo., for Missouri Pacific railroad, to American Bridge Co.
200 tons, paint and car shop for Sinclair Refining Co., Marcus Hook, Pa., to a Philadelphia fabricator.
200 tons, apartment 27 East Fifty-fifth street, New York, to Hedden Iron Construction Co.
175 tons, 100-foot bascule span and approaches over Lewis and Clark river, near Astoria, Oreg., for Oregon state highway commission, to Pacific Bridge Co.
143 tons, Shaw farm bridge, Bruce, Wis., to Wausau Iron Works.
125 tons, warehouse for Shadbolt & Boyd Iron Co., Milwaukee, to Lakeside Bridge & Steel Co.
100 tons, column cores for Pollock Huston building, Philadelphia, to McClintic-Marshall Co.

STRUCTURAL CONTRACTS PENDING

4000 tons, Library building, Cleveland; bids in May 28.
2500 tons, Milwaukee Elks' clubhouse; Massillon Bridge Co. low bidder.
2250 tons, ore spouts and framing at ore docks of Great Northern railroad, Superior, Wis.; bids in.
1500 tons, Mahoning avenue-Moravia street bridge, New Castle, Pa.; bids close May 15-16, formerly reported as 250 tons.
1200 tons, Butler Corp. building, 162 North State street, Chicago; bids in.
1000 tons, two bridges for Boston & Maine, each involving 500 tons; bids asked.
1000 tons, bridges for Baltimore & Ohio; bids asked.
800 tons, bridges for Norfolk & Western; bids asked.
600 tons, 300 each for schools No. 36 and No. 142 New York; pending.
500 tons, Illinois National Guard armory at Peoria, Ill.; bids in.
500 tons, 12 deck plate girder spans for Illinois Central railroad; bids in.
500 tons, garage and stables for Sheffield Farms, Jamaica, L. I.; pending.
500 tons, Chicago & Alton railroad; pending.
350 tons, Wigmore coliseum addition, Cleveland; Crowell & Little general contractors.
300 tons, building for Peddie institute, Heightstown, N. J.; bids asked.
260 tons, bank building, Newburgh, N. Y.; bids in.
200 tons, addition to Penn-Harris hotel, Harrisburg, Pa.; new bids asked.
200 tons, extension to Crawford building for J. L. Free Land Co., Cleveland; pending.
125 tons, building at 15 E. Fifty-seventh street, New York; pending.
125 tons, Commercial building, 14 E. Fifty-seventh street, New York; pending.
Tonnage not stated, 1000-foot bridge, part of Ocean Beach highway, Raymond, Wash.; pending.

Pittsburgh Producers Are Short of Labor

Pittsburgh, May 1.—While the importation of negroes is helping out the labor situation and operating schedules in certain nearby iron and steel manufacturing districts, the Wheeling Steel Corp., Wheeling, W. Va., reports that it is not adopting any extensive program of this sort. The Carnegie Steel Co., the Jones & Laughlin Steel Corp., and various other interests in the Pittsburgh territory are utilizing this method of augmenting their depleted labor forces. At Belaire, O. the Carnegie Steel Co. still is short about 200 men to fill the usual quota of about 1100 required to operate that plant at 100

per cent capacity. It is making approximately 1000 tons of steel daily, in two turns, and soon will increase that tonnage output. Its steel making delivery has reached 96 per cent of ingot capacity this week as against 93 per cent last week. The Carnegie company has 53 out of 59 blast furnaces active, having blown out one of the six at Duquesne works the middle of April for rebuilding. The Jones & Laughlin Steel Corp. continues to operate 100 per cent of blast furnace capacity as do several other smaller independent interests in this vicinity.

Program of May Institute Meeting Advanced

Announcement is made of the official program of the general meeting of the American Iron and Steel institute to be held at the Hotel Commodore, New York, May 25. The program is as follows:

Addressed by President E. H. Gary.
Paper, "Value of Chemistry in Iron and Steel Industry"—W. A. Forbes, United States Steel Corp., New York.
Paper, "Motor-Driven Rolling Mills"—P. E. Davies, electrical engineer, Interstate Iron & Steel Co., South Chicago.
Paper, "Standardization of Steel Mill Practice by Time Studies"—Robert Gregg, president, Atlantic Steel Co., Atlanta.
Paper, "Gas Producer Practice in Steelworks"—Waldemar Dryessen, United States Steel Corp., New York.
Paper, "Methods in Waste Elimination"—H. T. Morris, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa.
Paper, "Disintegration of Fire Brick Linings in the Blast Furnace"—C. E. Nesbit and M. C. Bell, research engineers, Carnegie Steel Co., Pittsburgh.

Ore Miners' Wages Raised

Duluth, May 1.—Effective today independent iron ore operators have advanced wages of miners from 10 to 15 per cent. All compaines are increasing their working forces in anticipation of the opening of the shipping season. Ore was shipped today from the Great Northern Missabe docks. Operations of the Oliver Iron Mining Co. are the highest in years and forces at some mines are being doubled. There is no labor shortage in the entire Minnesota district. The Minnesota Iron Co. is shipping 250 tons of sinter daily to the Ford furnaces at Detroit.

Chute Firm Is Organized

Philadelphia, May 1.—C. H. Chubback who for the past 17 years has been with the McClintic-Marshall Co., Pittsburgh, as Philadelphia district manager and in various other capacities, has resigned to become vice president of the Haslett Chute & Conveyor Co., organized to take over and expand the business of the Haslett Special Chute Co., Philadelphia. S. M. Haslett, San Francisco, is president of the new company and in addition to Mr. Chubback, P. E. Lanfesty is a vice president.

The Air Reduction Co., New York, reports net profit for the three months ended March 31, 1923, of $589,212 after interest and depreciation, but before federal tax. This is equivalent to $3.50 a share, against $2.74 a share in previous quarter and $1.25 in first quarter, 1922.

Deliveries Slow Car Orders

Good Sized Future Demand in Sight—More Rails Placed—Pennsylvania Wants 150,000 Tons—Light Rails Lag

RAILROAD TRACK MATERIAL PRICES, PAGE 1275

New York, May 1.—While car buying is not near the scale on which it was in the first quarter, particularly in March, and while trade interests generally regard the period of heavy buying by the railroads as past, at least for some time, a fair volume of car business is being placed, and some sizable lists are in prospect. The larger orders for the most part are ranging from 200 to 500 cars each, and there have been several of this size placed recently.

The outstanding locomotive order of the week calls for 35 for the Florida East Coast railroad, 20 going to the American Locomotive Co. and 15 going to Baldwin Locomotive Works. The Missouri Pacific is inquiring for 50 locomotives and the Chicago, Burlington & Quincy for five.

Preliminary figures for the month of April show a total of 9500 car awards during that month. Passenger cars awarded totaled 200 and locomotives 100.

Additional rail orders amounting to 42,000 tons for the Illinois Central and 40,000 tons for the Chicago, Milwaukee & St. Paul have been placed with western mills. These lots are understood to be for delivery in the last half.

Mines Buying As Needed

Pittsburgh, May 1.—Light rail business continues slow. Only small orders, mainly single carloads, are noted and these are placed as the needs of the mine operators require. Mine workings are not being greatly extended during the lull in coal mining. Because of this inactivity light rails have not shared much in the advances recently taking place in connection with various steel products and still remain quotable at 2.25c, base Pittsburgh.

Track accessories are somewhat duller than they have been in several weeks. Most users are well protected on their needs for two or three months to come. While standard spikes are quoted at 3.25c, Chicago, no tendency exists locally to follow that lead. One maker of boat spikes has advanced its price from 3.50c to 3.75c; another still retains the 3.50c figure so that the market is quotable at 3.50c to 3.75c, Pittsburgh. Tie plates are unchanged at 2.50c to 2.75c.

Rail Needs on Increase

Chicago, May 1.—Railroad needs are more pressing, as early delivery of cars, track fastenings and rails is necessary to make them available for use this season. Much pressure is being brought on steel mills to make deliveries direct to the roads and to car builders for this reason. Fewer freight cars are being placed than earlier in the year, simply because delivery cannot be made until too late for this fall's use.

Standard steel rails are in demand and requirements are taxing producers. In spite of the heavy tonnages placed last fall much additional rail material is being sought for this year's delivery. The Pennsylvania railroad is in the market for 150,000 tons additional for this year, a tonnage difficult to place under present mill conditions. Sales of 20,000 tons, 7000 tons and 5000 tons to western roads have been closed in the recent past. The Illinois Central, the Great Northern and the Chicago, Milwaukee & St. Paul railroads have been able to obtain some tonnage from mills to add to their former purchases.

Competition on light rails by rerolling mills producing lighter sections from standard steel rails is cutting into sales by producers of new rails. Considerable tonnage of light rails is being booked by both and sales are increasing. Track fastenings continue to be sought in large lots and mill obligations for these products are heavy as outside work is being done more generally by transportation lines.

CAR ORDERS PLACED

Matheson Alkali Works, 25 tank cars, to Standard Steel Car Co.
Johnstown Coal & Coke Co., 150 hoppers, to American Car & Foundry Co.
Union Pacific railroad, 50 cabooses, own shops.
Atlantic Coast line, five diners, to Pullman Co.
Atlantic Coast Line, 450 gondolas, to Virginia Bridge & Iron Co.
Bertha Coal Co., 300 coal cars, to Pressed Steel Car Co.
Brooklyn City Railway Co., 200 passenger cars, 100 each to St. Louis Car Co. and J. B. Brill Co.
Union Refrigerator Transportation Co. 100 refrigerators, to American Car & Foundry Co.
United States Fuel Co., 500 dump cars, to General American Tank Car Co.
Elgin, Joliet & Eastern railroad, 380 underframes, to Ryan Car Co., 250 to Hames C. Heggie & Sons.
Atlantic Coast line, 47 miscellaneous coaches, to Standard Steel Car Co.

CAR ORDERS PENDING

Hocking Valley has reduced inquiry for 2000 automobile box cars to 1000; bids closed May 2.
Florida East Coast, 200 flat cars, 200 box cars, and 10 cabooses.
Atchison, Topeka & Santa Fe, 50 express cars, bids asked.
Florida East Coast railroad, 8 flat cars, 2 baggage cars and 15 mail cars; bids asked.
Pennsylvania railroad, 59 coal cars; pending.
Anaconda Mining Co., 60 mine cars; pending.
Trumbull Steel Co., 75 miscellaneous cars; pending.

Steel Men Banquet Morris

New York, May 1.—C. B. McElhaney, formerly officially connected with the Cambria Steel Co. and the Colorado Fuel & Iron Co., Peublo, Colo, and later president of the American Steel Export Co., tendered Leigh B. Morris a farewell dinner at the Union League club on April 28. W. H. Donner, Leonard J. Replogle and other important steel men were present. Mr. Morris was tendered a dinner April 26 by the New York district sales agents of practically all the steel companies. He leaves shortly to assume his new duties as Pacific coast representative of the Bethlehem Steel Corp.

The Nonferrous Metals

Prices of Most Important Metals Continue To Decline—European Situation Is Felt—Copper Demand Light—Tin Recovers

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
April 25.....	17.00	17.00	44.37½	8.00	7.05	26.50	8.00	29.00
April 26.....	16.87½	16.87½	43.87½	8.00	6.97½	26.50	8.00	29.00
April 27.....	16.75	16.75	44.87½	8.00	6.90	26.50	8.00	29.00
April 30.....	16.75	16.75	45.00	7.75	6.85	26.50	7.75	29.00
May 1.....	16.75	16.75	45.00	7.75	6.80	26.50	7.75	29.00

†Outside market quotation.

NEW YORK, May 1.—Prices of practically all the more important nonferrous metals have declined further the past week, marking a continuation of the downward movement which has been in progress since about March 20, when concern over the federal reserve board's discount-rate policy first appeared. Since that time the industrial situation in Germany has become more nearly paralyzed and this has affected metal consumption of continental Europe, being reflected in the metal markets here and in London.

Demand for copper has been light, both foreign and domestic, and pressure of small outside offerings in the unwilling market has sufficed to bring about lower outside prices. Producers have marked down their quotation another ¼c, but have been yielding ground stubbornly. Electrolytic has been quoted at 16.75c, delivered, by the larger agencies, but outside holders and possibly custom smelters have quoted down to 16.50c, delivered. Casting copper dropped to 16c to 16.12½c. refinery; lake, 16.76c, delivered. All grades of copper and brass scrap and secondary refined ingot are lower than a week ago.

Tin prices recovered about ½c on May 1, due to better American inquiry, which has been in evidence since tinplate makers opened their books for third quarter delivery. The prices for spot Straits have ranged from 44.50c to 45.50c. American tin deliveries again were heavy last month, amounting to 6675 tons; tin in stock and landing decreased rather sharply during the month to 3677 tons as of May 1. However, the supply is sufficiently large to prevent any alarm about the immediate situation.

Zinc prices have declined steadily, without stimulating buying to any extent, although inquiry this week has been a little broader. Prime western quotations have dropped about 30 points in the past week, to 7.80c, East St. Louis, 8.15c New York. Brass special is quoted at 10 points premium over prime western; high grade is quoted 8.50c to 9c, delivered.

Lead has dropped, due to the recent moderate offerings of foreign lead in this country, lead which previously was absorbed on the continent. The American Smelting & Refining Co., reduced its lead price ¼c April 28 to 7.75c, New York and outside sellers are meeting this price for May shipment. Prompt deliveries still command a slight premium. In the west competition has continued to drive prices down, the market dropping from 7.85c a week ago to 7.52½c, St. Louis, today. Demand is principally for small lots.

Spot antimony prices have declined to 7.75c, duty paid, without interesting buyers. Metal afloat from the Orient has been offering for resale at 5.75c, c.i.f., in bond.

Jobbers have been having no difficulty in getting above 2.28c for small lots of 99 per cent virgin ingot and large quantities are not obtainable anywhere in the outside market at any price. The quotation for virgin ingot 98 to 99 per cent in the outside market is nominally 26.50c and for 99 per cent 27.50c, New York or Detroit.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	25.50
High brass	21.75
Zinc, ga. 9 to 18 (plates ½c less)	10.00
Lead, full sheets (cut ¼c more).	11.50
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	26.50
Copper	28.00
RODS	
High brass, round, ⅛ to 2½ inch	20.00
Naval brass rod	22.25
WIRE	
Copper	19.50
High brass	22.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	11.50 to 12.00
New York	11.25 to 11.50
Chicago	12.00
HEAVY YELLOW BRASS	
New York	8.25
Chicago	9.00
Cleveland	8.50 to 9.00
ZINC	
New York	4.25 to 4.75
Cleveland	4.50
HEAVY COPPER AND WIRE	
Cleveland	13.00 to 13.50
New York	13.00 to 13.50
Chicago	13.50
RED BRASS TURNINGS	
New York	10.00 to 10.25
Cleveland	10.00 to 10.50
Chicago	10.50
YELLOW BRASS TUBING	
Cleveland	9.00 to 9.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	8.50
New York	7.75 to 8.00
Chicago	8.50
ALUMINUM BORINGS	
Cleveland	13.00 to 15.00

Reorganize Gear Firm

A complete reorganize of the board of directors of the Stevenson Gear Co., of Indianapolis, has been effected. Five new directors were elected to fill vacancies caused by the resignation of B. A. Worthington, R. T. Wingo, T. B. Hassler, T. J. Stevenson and W. C. Starkey from the board earlier in the year. The stockholders approved the production program of the company as outlined by G. E. Stevenson and G. R. Stevenson who have been in active charge of the plant.

Valley Operating Rates Continue Unchanged

Youngstown, O., May 1.—No interference in the substantial rate of steelworks and finishing mill operations, which has been maintained throughout the Mahoning valley district for the past two months, is apparent. Ninety-two per cent of independent open-hearth capacity representing 47 of the 51 units still are engaged. The Youngstown Sheet & Tube Co., is charging 11 furnaces each at its East Youngstown plant and Brier Hill division, the Republic Iron & Steel Co. 12, the Trumbull Steel Co. 7 and the Sharon Steel Hoop Co. 6.

Sheet mill activities receded 1 per cent to 98 per cent of capacity due to the reconstruction of pair and heating furnaces at the plant of the Mahoning Valley Steel Co. Of the 115 active sheet mills in this district the Youngstown Sheet & Tube Co. has 42 units under power; the Newton Steel Co. and the Republic Iron & Steel Co. 17 each; the Trumbull Steel Co. 15; the Sharon Steel Hoop Co. 9; the Falcon Steel Co. 8; and the Mahoning Valley Steel Co. 7.

Miscellaneous operations have undergone no appreciable change. The Republic Iron & Steel Co. has 6 finishing mills, 6 pipe mills and the bessemer department active and will put on its 8-inch bar mill later in the week; the Youngstown Sheet & Tube Co. is operating 10 pipe, 2 merchant bar, and 3 plate mills and its rod, wire and bessemer departments. The Trumbull Steel Co. reports 19 hot tin mills under schedule and 100 per cent operation at its strip departments. The Falcon Steel Co. is operating 6 hot tin mills at its Canton, O., works and would have 3 additional units rolling if hot mill crews were available. The shortage of labor is becoming more distressing daily and is holding up a large gain in operations.

Chicago Production Gains

Chicago, May 1.—Somewhat better operating rates are being maintained by Chicago steel mills, with some increase in output, though a decreased use of scrap in steel making nullifies to some extent the increase in pig iron. The Illinois Steel Co. has blown in its twelfth blast furnace stack at the Gary works, giving full pig iron production there for the first time in more than two years. At South Works, 10 of the 11 stacks are producing and at Joliet 3 out of the 40. The percentage of production is increased a few points from the preceding rate. Inland Steel Co. is operating at 75 to 80 per cent of capacity and this is regarded as the probable maximum until fall as hot weather interferes in the sheet mills and balances increased production in other departments.

West Sees Labor Troubles

Lumber Industry Threatened at Present— Wage Advances Holding Back Construction Work—New Freight Rates Are Announced

Seattle, April 28.—While prosperity is general in the Pacific Northwest, impending labor troubles are casting a cloud on the situation. Higher wages are being demanded in a number of industries and it is expected that cessation of activity may result in some quarters. The lumber industry is threatened at present and this will affect iron and steel which have been catering to a heavy demand from loggers and lumbermen. The recent advance in wages in the building trades is already said to be holding back considerable contemplated work.

The market has been without special feature during the week. Business is excellent although it consists mostly of small tonnages. However, the aggregate is large and all branches of the iron and steel industry report good activity. There is still general complaint about deliveries. Dealers who are hard pressed for material are able to fill orders promptly only by paying premiums.

It is evident that the intercoastal conference is not to be reorganized in the near future and the chances are that the westbound water rate on steel will not be advanced above present levels of 30 cents.

New export rates on steel and iron that are expected to stimulate the movement of these products through Pacific Coast ports have been announced by the transcontinental railroads. The districts affected are Chicago, Colorado and Utah. This action has been taken to meet water competition. The new export tariff will be 40 cents per 100 pounds from Chicago, a reduction of 10 cents. From Utah the rate is reduced from 30 to 24 cents while from Colorado territory the new rate is 31 cents instead of 38½ cents.

During the first 21 days in April, Seattle building permits totaled $1,679,495 compared with $1,632,175 for the entire month of April, 1922.

Shortage of plumbing supplies is threatened in this district because of the inability of producers to fill orders. Price fluctuations are also having a retarding influence. There are shortages in many sizes of iron pipes, radiation equipment, boilers and similar supplies.

Pig Iron and Coke

Pig iron is stationary but firm. Importers see no weakness although they do not anticipate higher prices. This territory is being supplied entirely by foreign iron as southern cannot compete. No. 1 Glengarnock is being sold at $40 and $41 delivered, buyer's plant. Some India iron is enroute to San Francisco, one order of 2500 tons having been placed. It is being offered at San Francisco at $35 c.i.f. Because of lack of direct water transportation this iron cannot be brought into southern California, Oregon or Washington ports on a competitive basis.

Coke is in good demand as practically all the consuming plants are operating. The last order of British coke, booked months ago at $16.50 delivered here, has arrived. It is now worth around $26. Fernie is supplying much of the demand on this coast, its price remaining firm at $16.50. About 2000 tons of this grade was sold on the Coast last year. Seattle is at present importing 500 tons a month of Fernie. Wilkeson coke, a local product, is selling here at $12.08, being used in combination with Fernie.

Bars, Plates and Shapes

There is a good turnover of these items although mostly in small tonnages. Increasing firmness is apparent. This week the local steel mill raised the prices of steel merchant bars from 3.00c to 3.10c, while reinforcing bars are quoted at 3.10c to 3.25c according to the job. Jobbers also advanced their prices 10 cents per 100 pounds, bars now being sold at 4.10c, small shapes at 4.10c and large shapes at 4.20c. Shapes and plates are active and many shops with contracts on hand have been caught short of supplies and are unable to buy at prices on which jobs were figured. Independent sources are offering shapes at 3.00c, Philadelphia, which with freight added means 3.30c here.

The Pacific Coast Steel Co. is operating three out of four open-hearth furnaces and has much work on the books. Total sales of reinforcing bars in the last two weeks have been over 1000 tons. Increased export inquiry for both merchant and reinforcing bars is reported, between 300 and 400 tons having been placed in China. Foreign interests, unable to buy elsewhere, are now content to compete in price with domestic buyers here.

Other Finished Material

Jobbers report April business showing a gain over the same period in March. There is a good demand for everything in stock. Sheets are coming into a better demand with the advance of the season and a big movement will be under way within 60 days. During the week bands have been advanced from 5.00c to 5.10c.

Aside from bars foreign buyers are showing little interest in this market although there have been occasional inquiries for rails and sheets.

Old Materials

The market is active. Sustained firmness is reported with No. 1 cast iron strong at $28 to $30 and steel scrap moving freely at $14 to $16 according to grade. Scrap rail is in excellent demand which has sent prices up to $20 and $22.50 per gross ton. Railway scrap is also strong at $15 to $17 while axles are quoted at $22 to $24. Japanese buyers are watching the scrap market closely and whenever they can get cheap space they are able to buy limited quantities of steel scrap for which the demand in Japan continues unabated. The entire scrap situation is exceptionally firm with supplies limited.

The city of Seattle is in the market for 27,000 feet of galvanized wrought iron pipe and 2000 malleable iron or cast steel shoes for wood stave pipes ⅝ x 48 inches inside diameter.

Machine Tool Builders Announce Program

The program for the twentieth annual spring convention of the National Machine Tool Builders association, to be held at the Hotel Greenbrier, White Sulphur Springs, W. Va., May 9 to 11 has been announced as follows:

WEDNESDAY, MAY 9

Morning Session, 9 a. m.—Registration, general business session, reports of officers, reports of standing committees.

Afternoon Session, 2 p. m.—Round table discussion of administrative and executive department topics.

Evening Session, 7 p. m.—Banquet, address by Dean Dexter S. Kimball, Cornell university, on "Machine Tools: The Master Tools of Industry."

THURSDAY, MAY 10,

Morning Session, 9:30 a. m.—Round table discussion of sales department topics.

Afternoon Session, 2 p. m.—Round table discussion of association activities.

Evening Session, 8 p. m.—"Making Better and Cheaper Containers for both Foreign and Domestic Shipment," by C. A. Plaskett, acting in charge of container investigations, United States forest products laboratory, Madison, Wis.

FRIDAY, MAY 11,

Morning Session, 9 a. m.—Meetings of following committees: Lathes, horizontal boring machines, milling machines, shapers, upright drilling machines, vertical boring mills, punches and shears.

Afternoon Session, 1:30 p. m.—Meetings of the following committees: Grinding machines, gear cutting machines, hand milling machines, planers, radial drilling machines, turret lathes and screw machines, sensitive drills.

Fabricated Shape Output Falls Off in 1921

Washington, May 1.—Value of products of establishments engaged primarily in the fabrication of structural ironwork amounted to $250,085,000 in 1921, as compared with $294,963,000 in 1919 and $159,378,000 in 1914, according to reports of the bureau of census. In addition to this total, steel works and rolling mills in 1922 reported the fabrication of structural steel with a value of $13,673,000 and in 1919 reported a value of $10,158,000.

Of the 1022 establishments reporting products valued at $5000 and over in 1921, 245 were located in New York, 122 in Pennsylvania, 100 in Illinois and 94 in Ohio. Pennsylvania ranked first in the industry in 1921, contributing 28 per cent of the total value of the products, those in Ohio amounting to 13 per cent of the total and those of New York amounting to 11 per cent.

In January, the month of maximum employment, 38,290 wage earners were reported, and in December, the month of minimum employment, 30,527. The average for the year was 32,897 wage earners.

April Pig Iron Sets New Record

Production with Total of 3,547,012 Tons Surpasses Previous High Mark by 23,417 Tons —Average Daily Output Also Establishes New Level of 118,233 Tons Per Day—Active Stacks Total 310

WITH a production of 3,547,012 gross tons, both the total and average daily output of pig iron in April reached the highest point in the history of the American iron industry. The previous highest total production was in March when 3,523,595 tons of iron was made. March, however, was a 31-day month as compared with the 30-day month of April. The average daily output of April of 118,233 tons surpasses the previous highest rate on record of 113,774 tons in September, 1918, by 4459 tons per day. In spite of the fact that both total and daily production records were broken in April, the number of blast furnaces active on the last day of the month was less by 61 stacks than the highest figure on record, which was in August, 1918. Then 371 furnaces were blowing. During April a net gain of 15 furnaces were shown bringing the operating total on April 30 to 310.

The record of April again emphasizes the higher output per furnace, due principally to the increased capacities of the modern stack and the greater efficiency of operation as compared with earlier periods. The daily rate of April was approximately 11,700 tons greater than the average daily rate for 1916 when the highest total for a full year was established.

As compared with the 3,523,595 tons of iron made in March the 3,547,012 ton output of April shows an increase of 23,417 tons. This gain was made in spite of the fact that April was a one day shorter month. The average daily production of April of 118,233 tons represents an increase of 4569 tons over the 113,664 tons daily rate of the previous month. Compared with the low point of July, 1921, when the average daily rate was 27,892 tons, the April rate represented an improvement of 90,341 tons or about 323 per cent more.

Merchant iron made in April totaled 787,796 tons and was an increase of 20,577 tons over the 767,219 tons of the month before. On an average daily basis this output was 26,260 tons per day and a gain of 1511 tons over the 24,749 ton daily rate of March. Nonmerchant production aggregated 2,759,216 tons, compared with 2,756,376 tons in March, the increase being 2,840 tons. This represented a daily rate of 91,973 tons in April as against 88,915 tons the previous month, the gain being 3058 tons per day.

Furnaces operating on April 30 totaled 310, this being a gain of 15 over the 295 active on March 31, and the highest since September, 1920 when 317 were in blast. During the month 10 merchant stacks were blown in and two blown out or banked, the net gain being eight stacks. Of the nonmerchant class eight were blown in and one blown out, the increase being seven.

Of the total number of furnaces active on the last day of the month, 97 were merchant and 213 nonmerchant. The corresponding figures for March were 89 merchant and 206 nonmerchant. On April 30 the Steel corporation was operating 113 furnaces as compared with 108 on March 31 and 101 on Feb. 28.

Stacks blown in during the month were: In Ohio: Hamilton, Hamilton Furnace Co.; Wellston, Wellston Iron Furnace Co. In Pennsylvania: Edith, Carnegie Steel Co.; Fannie, M. A. Hanna & Co.; Stewart, Stewart Furnace Co.; Josephine No. 1, McKinney Steel Co.; and North Cornwall G, Steelton E, Bethlehem Steel Corp.; one Coatesville, Midvale Steel & Ordnance Co. In New Jersey: Wharton B, Replogle Steel Co. In Virginia: Crozer, Virginia Iron, Coal & Coke Co. In West Virginia: Wierton, Wierton Steel Co. In Tennessee: Rockdale, J. J. Gray Jr. In Indiana: Gary No. 3, Illinois Steel Co. In Illinois: South Works Nos. 7 and 10, and Joliet No. 3, Illinois Steel Co. Adrain, Adrain Furnace Co.

Among the stacks blown out during April were: In Ohio: Anna, Strutchers Furnace Co.; River No. 2, McKinney Steel Co. In Pennsylvania: Sheridan No. 2, E. J. Lavino & Co.

MONTHLY PRODUCTION

	1923	1922	1921
January	3,228,226	1,645,804	2,414,753
February	2,993,918	1,630,180	1,929,394
March	3,523,595	2,035,908	1,594,866
April	3,547,012	2,070,161	1,190,751
May		2,309,348	1,215,272
June		2,362,455	1,064,007
Total 1st half	13,292,751	12,053,856	9,409,043
July		2,403,030	864,642
August		1,810,655	954,901
September		2,024,008	985,795
October		2,629,655	1,234,450
November		2,846,110	1,414,958
December		3,083,520	1,642,775
Total 2nd half		14,796,988	7,097,521
Grand total	13,292,751	26,850,844	16,506,564

AVERAGE DAILY PRODUCTION

	1923	1922	1921	1920	1919
Jan.	104,136	53,090	77,895	87,172	106,654
Feb.	106,925	58,220	68,906	102,904	105,270
Mar.	113,664	65,674	51,447	108,895	99,614
Apr.	118,233	69,005	39,691	91,754	82,479
May		74,495	39,202	96,510	67,991
June		78,748	35,466	101,533	70,467
July		77,517	27,892	98,190	78,200
Aug.		58,408	30,802	101,468	88,453
Sep.		67,466	32,857	104,143	82,692
Oct.		84,827	39,821	106,075	60,142
Nov.		94,870	47,165	87,836	80,244
Dec.		99,468	52,992	87,105	84,711
Ave.	111,703	73,563	45,223	99,456	83,910

DIVISIONS OF PRODUCTION

1922	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
Mar.	390,643	1,645,265	2,095	11,604	1,102
Apl.	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,873	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	353,604	1,670,404	4,235	10,681	934
Oct.	502,231	2,127,424	12,285	9,193	1,080
Nov.	603,348	2,242,762	4,192	13,232	961
Dec.	668,950	2,414,570	10,591	17,108	989
Tot'l	5,257,717	21,593,127	68,589	150,039	11,713
1923					
Jan.	713,186	2,515,040	12,056	19,358	952
Feb.	708,901	2,285,017	3,657	21,410	759
March	767,219	2,756,376	13,832	20,730	236
April	787,796	2,759,216	7,414	20,794	670

APRIL PIG IRON

	No. of stacks	No. in blast last day in month April	March	Total tonnage made Merchant	Nonmerchant	Totals April	March
Pennsylvania	155	120	113	215,871	1,120,712	1,336,583	1,302,396
Ohio	80	65	65	144,955	683,643	828,598	857,920
Alabama	43	27	27	123,324	115,370	238,694	253,632
Virginia	19	5	4	21,297	.....	21,297	22,378
New York	26	20	20	97,155	135,606	232,761	223,938
New Jersey	4	2	1	18,832	.....	18,832	12,551
Illinois	26	21	16	60,747	254,345	315,092	295,454
Colorado	5	3	3				
Indiana	16	16	15	47,768	317,117	364,885	363,068
Maryland	6	6	6				
Wisconsin	6	4	4				
Kentucky	7	3	3				
West Virginia	5	4	3	28,503	58,374	86,877	79,674
Tennessee	14	8	7				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	18,462	56,053	74,515	77,786
Michigan	4	3	3				
Missouri	1	0	0				
Spiegel and ferro-all states	...	...	...	10,882	17,996	28,878	34,798
Totals	424	310	295	787,796	2,759,216	3,547,012	3,523,595

European Prices Still Softening

British Billets and Plates and Middlesbrough Foundry Iron Lower—Ferromanganese Sold at an Advance, Strongest Feature of Market—American Coke Landed in France Offered at $16.75

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, April 30.—Except for ferromanganese, the markets everywhere reflect easier conditions. One producer has sold several thousand tons of Middlesbrough No. 3 foundry iron at a reduction of 2 shillings 6 pence ($0.68). This iron now is quoted at £6 5s ($28.98). Weakness is resulting partially from lessened continental demand. The market for ferromanganese is the tightest, small tonnages for third quarter being sold at £20 ($92.80) f.o.b. This advance is due partly to the fall in the rate of sterling exchange. Ferromanganese for export now is quoted at £19 ($88.16) or £1 more than a week ago. Certain producers are quoting $127.75, c.i.f. United States. The supply of manganese ore continues short, Indian and Russian ore being quoted at 23 pence ($0.44) per unit c.i.f. United Kingdom.

Sterling—$4.64

American coke recently landed in France is offered at $16.75 by local merchants.

The French correspondent of IRON TRADE REVIEW wires from Paris:

"Receipts of German coke are averaging 5000 tons daily, but the coke is coming from Ruhr stockpiles while production there remains unsatisfactory. A few more blast furnace stacks in Lorraine have been relighted. Foundry pig iron is quoted 475 francs ($32). Production is now about equal to the domestic demands."

While Germany is awaiting new political moves, the temper of the inhabitants of the Ruhr is ugly and big bridges between Hattinger and Vorhalle have been dynamited. Such acts of violence are further throttling transportation. Slightly more steel is being shipped from the Ruhr district under French licenses.

British mills are receiving large specifications but small new orders. Billets are offered at £8 10s ($39.41), or 5 shillings ($1.16) less than a week ago. English and Scotch home and export plates are quoted £10 ($46.36), 5 shillings under the price that was being quoted a week ago.

British Works Steadily Increasing Their Output

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., April 20.—The rate of progress in pig iron production is at last being accelerated. The March output according to the monthly report of the National Federation of Iron and Steel Manufacturers was 633,600 tons, an increase of about 90,000 tons over the previous month and representing the highest monthly production since January, 1921, when the figure was 642,100 tons. The furnaces blowing at the end of March numbered 202, an increase of 13 during the month. The output was more than 50 per cent above the monthly average of last year and compares with 669,500 tons in 1920 and 855,000 tons in 1913.

Optimism is further encouraged by the figures recording the output of steel ingots and castings in March. The production was 802,500 tons which is the highest since September, 1920, a boom period when the output was 844,700 tons. It will be seen that the prewar monthly average of 638,600 tons is left far in the rear, and the 1920 average of 755,600 tons is also well behind. No doubt the peak figure of September, 1920, which was 884,700 tons will be exceeded during the present month. A number of Siemens furnaces have been started in April, including a large plant at Ebbw Vale, and the Sheffield output is still increasing.

There is some reason to hope that a further important stride in the return toward prewar tonnage will be made during the present month. After seven months' idleness the two large modern blast furnaces at Ebbw Vale have restarted this week, and will have an immediate effect upon the general output.

Sterling—$4.66

Some other furnaces are being got ready and the North Skelton Ironstone mines of Bolckow Vaughan & Co., Ltd., after being idle for two years are about to be reopened. It is understood that another large mine will shortly be at work.

The Birmingham quarterly meeting held yesterday attracted an unusually large attendance, though the business actually done was small. Merchants and manufacturers came from all the iron and steel centers, frankly for the purpose of investigating market conditions. The decline in coke exports has not escaped notice, and a sequel to this is a series of offers by cokemakers to increase their weekly consignments to the furnaces, usually by about 100 tons and upward.

So far no sign of weakening in pig iron prices is evident. On the West Coast a brief lull has been followed by a sharp revival of buying. The continental countries, particularly France, Belgium and Germany are placing orders continuously, and Scotland and South Wales also are buying high grade iron. Prices there are well maintained.

On the East Coast coke supplies are not increased sufficiently to enable a single furnace to be restarted, and it is doubtful whether the whole of the present plant can be maintained in action. The ironmasters are practically sold up to the middle of the year and can only offer iron for July delivery. At present ordinary pig iron prices remain unchanged. No. 3 Cleveland selling at £6 7s 6d ($29.70) and hematite at the same price, although makers are accepting 2 shillings 6 pence ($1.74) less for June delivery. Ferromanganese has increased £1 to £18 ($83.88).

France and Belgium have recently had a great deal of business with Germany canceled, and it is now commonly reported that both countries are making more steel than they can sell. The ultimate destination of this is believed to be Great Britain, and consumers accordingly are postponing orders. For the present any such development is purely prospective.

By way of exception merchants who have received consignments on old contracts occasionally try to encourage business by selling below the current rate. For example a London merchant yesterday offered to supply steel sections for delivery within the next month on the basis of £8 15s ($40.77) Antwerp or £10 ($46.60), delivered here. A few merchants who have bought English material on the prices of six or eight weeks ago can underquote present mill prices. No. 3 Belgian iron is 5 shillings ($1.16) cheaper at £10 10s ($48.93) delivered, and this is being bought for nut and bolt making. All such quotations, however, are not representative of the real state of the market. On the contrary, several of the leading mills have put up their prices.

At the Birmingham meeting Welsh mills quoted £9 17s 6d ($46.01) for August delivery, an advance of 2 shillings 6 pence ($0.58) on last week's booking for July business. Light steel plates were increased 10 shillings ($2.33) to £11 ($51.26) and marked bars were increased by Staffordshire makers from £14 ($65.24) to £14 10s ($67.57). Coincidently with this rise in best iron, medium qualities are higher. Lancashire nut and bolt iron is £10 17s 6d ($50.67)

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, April 30

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	39.41	8 10 0
Sheet bars	40.57	8 15 0
Wire rods	57.95	12 10 0
FINISHED STEEL		
Steel bars, England, ¾ to 3-inch	49.84	10 15 0
Steel bars, England, ½ to 3-inch, for export	48.68	10 10 0
Plates, ship, bridge and tank, England	46.36	10 0 0
Plates, ship, bridge and tank, Scotland	46.36	10 0 0
Beams, England	46.36	10 0 0
Beams, Scotland	46.36	10 0 0
Sheets, black, 24-gage	62.59	13 10 0
Sheets, galvanized, 24 gage	90.40	19 10 0
Rails, 60 pounds and over	47.52	10 5 0
Rails, 60 pounds and over, for export	46.36	10 0 0
Tin plate, base box, 108 pounds	5.91	1 5 6
Steel hoops	57.95	12 10 0
Steel hoops, for export	55.63	12 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	28.98	6 5 0
Hematite, West Coast, Mixed Numbers	29.55	6 7 6
Basic Middlesbrough	28.39	6 2 6
No. 3 Foundry, Middlesbrough	28.98	6 5 0
No. 3 Foundry, Derby, Leicester, Nottingham	25.50	5 10 0
No. 3 Foundry, Northamptonshire	24.91	5 7 6
No. 3 Foundry, Staffordshire	26.66	5 15 0
No. 3 Foundry, Scotch	27.82	6 0 0
Ferromanganese, 76 to 80 per cent	83.45	18 0 0
Ferromanganese, 76 to 80 per cent, for export	88.08	19 0 0
COKE		
Yorkshire furnace	6.95	1 10 0
Yorkshire foundry	8.11	1 15 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	32.20	678,300
Foundry, No. 3, Oberhausen	30.64	645,300
Bessemer Stahleisen, Siegen	34.96	736,300
Foundry, No. 1, Oberhausen	30.78	648,300
Luxemburg Foundry	30.12	635,300
COKE		
Ruhr furnace	5.02	105,740
Ruhr foundry	5.17	108,950
SEMIFINISHED STEEL Open-hearth quality		
Billets	41.31	870,000
Sheet bars	50.56	1,065,000
Wire rods	49.09	1,034,000
FINISHED STEEL Open-hearth quality		
Standard rails	50.90	1,072,000
Merchant bars	56.36	1,187,000
Structural shapes	55.79	1,175,000
Ship plates	63.81	1,344,000
Medium plates, 3 to 5 millimeters	70.75	1,490,000
Sheets, below 3 millimeters	79.72	1,679,000
Tin plate	60.16	1,267,000
Plain wire	67.13	1,414,000
Bands and strips	79.72	1,679,000
Sheets below 1 millimeter		

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	38.85	535
Basic bessemer, Lorraine	35.00	500
Foundry, Longwy, No. 3, sand-cast	33.60	480
Foundry, Longwy, No. 3, chill-cast	35.00	500
Ferromanganese, 76 to 80 per cent	80.50	1,150
COKE		
French furnace	9.45	135
German furnace, f.o.b. frontier*	13.86	198
German furnace, f.o.b. frontier*	21.70	310
French foundry	10.15	145
SEMIFINISHED STEEL		
Blooms	43.05	615
Billets	45.15	645
Sheet bars	46.55	665
FINISHED STEEL		
Standard rails	38.50	550
Merchant bars	57.05	815
Angles	54.25	775
Normal beams and profiles	54.25	775
Plates, ship and tank, 10 millimeters and thicker	60.20	860
Plates, bridge and tank, 5 to 10 millimeters	62.30	890
Sheets, black, 3 millimeters	65.10	930
Sheets, blue annealed, 2 millimeters	75.60	1,080
Shafting, cold-drawn, 40 to 60 millimeters	98.00	1,400
Bars, 2 per cent nickel steel	117.25	1,675

All prices are f.o.b. furnace or mill.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	25.80	430
Basic open-hearth, Belgian	32.70	545
Gray forge, Belgian	16.20	270
Foundry, No. 3, Belgian	34.20	570
Foundry, No. 3, Luxemburg	34.20	570
Foundry, No. 3, Lorraine	33.60	560
SEMIFINISHED STEEL		
Blooms	37.50	625
Billets	40.50	675
Sheet bars	44.40	740
Wire rods	55.50	925
FINISHED MATERIAL		
Standard rails	43.50	725
Merchant bars	45.00	750
Normal beams and profiles	43.50	725
Plates, 5 millimeters and thicker	45.60	760
Sheets, black, 3 millimeters	51.00	850
Sheets, galvanized, 1 millimeter	120.00	2,000
Plain wire	79.50	1,325
Galvanized wire	90.00	1,500
Wire nails	81.00	1,350

All prices are f.o.b. furnace or works.

and Staffordshire £11 12s 6d ($54.17).

An effort to depress the scrap market seems to have been abortive. Buyers who withheld their orders a week ago have in some cases closed at a figure 5 shillings ($1.16) above the quotation formerly refused.

Almost without exception the tin plate mills are well furnished with orders for the next three months, and as a rule, are not disposed to consider business on a lower basis than £1 5s 6d ($5.93) per box, which represents an increase of about 1 shilling ($0.23) over recent quotations. Inquiries from the Continent are numerous, and English buyers who have been slow in entering the market are now keen for supplies.

Galvanized sheets are selling freely on the basis of £19 10s ($90.87) to £20 ($93.20), makers having good order books. There is some concern in the tin plate department over the threat of the Belgian government to impose an import duty on tin plate. The matter is regarded rather seriously as Belgium is a good customer for this material.

England Threatens French Coke Supply

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaissance.

PARIS, April 21.—Despite the great efforts the French are making in the Ruhr to obtain coke, results have been rather disappointing to the iron and steel producers. Several weeks ago when requisitioning began, the metallurgical industry was told that by the middle of April they could expect to receive about 6000 tons of Ruhr coke daily and that by the end of the month shipments would average 9000 tons daily. As a matter of fact receipts of Ruhr coke have been running about as follows: April 3, 1313 tons; April 4, 2171 tons; April 5, 1360 tons; April 6, 2799 tons; April 7, 1324 tons; April 8, 2370 tons. To make matters worse England is now said to be contemplating an embargo on coke ship-

Franc—$0.07

ments to France. The importance of such a move cannot be overemphasized and if the English eventually decide to take this step it will seriously embarrass French blast furnace operators in the East and in Lorraine. Exports of coke to France from England amounted to 63,000 tons in February alone. English coke now is costing the French around 70 shillings ($16.31) c.i.f. French port, whereas American coke is averaging $17. Orders for coke totalling 80,000 tons were placed in the United States by French consumers during March.

Pig iron production is increasing slowly, but little progress can be made in this direction until the coke situation becomes easier. Chill-cast foundry No. 3 is now quoted at 500 francs ($35) f.o.b. furnace. Hematite and synthetic pig are quoted at 550 francs ($38.50) but it is doubtful whether large quantities of any grade of pig can be had by an outsider, as the furnaces are rationing out tonnage to their old customers. Ferroalloys still are advancing. Ferrosilicon (25 per cent) is now quoted at 800 francs ($56).

The demand for semifinished steel products is tapering off and manufacturers now are in position to offer fairly prompt shipment. Merchant bars and other finished steel products are being quoted 10 per cent lower than peak prices of three weeks ago. Beams are being offered at 750 francs ($52.50). Plates are holding up fairly well and prices vary according to districts. Buyers claim that the plate market has not shown any signs of steadiness since the Comptoir des Toles, the plate selling syndicate, was dissolved. English and Belgian plates continue to find their way into France.

The problem of modifying prices on old contracts is still troubling sales departments. In many instances the prices given customers were used for estimates on tenders and as these jobs are now coming in, buyers demand that they be given protection; manufacturers feel that they should not be obliged to stand the whole loss.

German Output 10 Per Cent of Normal

European Special Service

DUSSELDORF, Germany, April 20.—Conditions in the Ruhr still remain unchanged outwardly, but there are signs that resistance on the part of the German population is weakening. More plants have shut down and those which are still working are producing only a nominal output.

There is practically no railway traffic on the left bank of the Rhine except for military purposes although trains are running regularly inside the English zone around Cologne. On the right bank of the Rhine in the Ruhr district and north of Dusseldorf there is still traffic on some of the branch lines which have not been interfered with by the military authorities. Canal and river traffic is limited to the transportation of foodstuffs. A large amount of traffic still is moving by motortruck, but cars now must be provided with military passes from the occupation authorities. The postal, telephone and telegraph services in the Ruhr district are working very irregularly and are partly subject to military censorship.

Fuel prices in the occupied territory are unchanged but the price of coal outside the Ruhr has been reduced from

Mark—$0.000047

5000 marks ($0.25) per ton to 3000 marks ($0.15). The unoccupied districts are well provided with English coal at present although the import of English and American fuel undoubtedly will decrease in the near future. The stocks of coal in the Ruhr are diminishing as the German consumers refuse to pay the transportation tax which the French authorities have put on all traffic. Production is not more than one-tenth of normal and the miners are occupied almost exclusively on repair and preparatory work in the collieries.

It is almost impossible for factories in unoccupied Germany to obtain iron and steel from the Ruhr district as the blockade is completely effective and all traffic is stopped except on goods for which an export license has been obtained from the occupation authorities. German firms, however, still decline to apply for such licenses and no goods are coming out of the Ruhr district except by smuggling. Pig iron and steel are still being imported from America, Great Britain and Sweden by manufacturers in the nonoccupied territory to replace to some extent deliveries from the Ruhr, but as the imports must be paid for at full value in foreign currency importers are having difficulty to procure the necessary money. The German government is now discouraging imports in its efforts to consolidate the value of the mark.

Prices remain nominal and the production of pig iron and semifinished products is now about 10 per cent of normal. In many cases the cost of transportation by motortruck exceeds the value of the product. Ruhr pig iron producers are unable to obtain limestone.

Prices for semifinished products have been reduced on account of the slightly lower fuel prices. Billets and sheet bars are being sold at 870,000 marks (41.30) to 1,065,000 marks ($50.56) per metric ton, with shapes, bars and plates 1,175,000 to 1,344,000 marks ($55.78 to $63.81). Black sheets under 1 millimeter are 1,679,000 marks per ton ($79.73), with plain wire 1,267,000 marks and bands 1,414,000 marks ($60.18 and $67.13).

Prussian Lines Buy Rails in Austria

European Special Service

Austrian Crown—$0.000014

VIENNA, April 20.—The Prussian railways have recently placed heavy orders with Austrian rolling mills for the supply of a very large quantity of rails so that most of the mills are now full for several months ahead. The Vienna locomotive works of Warchalovsky have undertaken to deliver 200 locomotives for the Italian railways within the next three years. The Austrian machine industry, however, still is stagnant and car building works have reduced their hours of work and dismissed some of their employees.

It is said that a selling organization has been set up by Austrian and Hungarian magnesite works and also that an agreement has been reached with American interests for the formation of a syndicate with the object of securing not only the European magnesite market but also part of the American market, uniform prices being agreed upon. It is a well known fact that during the war the world monopoly of the Austrian and Hungarian magnesite deposits broke down owing to the discovery of large deposits on the west coast of America.

As a result of the coal miner's strike in the Ostrau district of Czecho-Slovakia, five of the blast furnace stacks in the district have been blown out owing to shortage of coke. The miners have now returned to work. Heavy foreign orders have been received from Germany, Belgium, France, Jugoslavia, Japan, and South America. Czecho-Slovakian iron and steel exports during the first two months of 1123 amounted to the value of 84,000,000 Czech crowns ($2,436,000). Owing to the higher prices paid for iron and steel exported there is now a shortage within Czecho-Slovakia as the reserves are being used up.

The Hungarian iron and steel market is improving considerably and home and foreign orders are coming

Czech Crown—$0.029

in. The machine works have plenty of orders, notwithstanding the recent strikes which lasted five weeks, and export business has been increased by the depreciation of the Hungarian crown. In consequence of the the recent heavy orders received from Germany the Rimamurany company probably will relight three blast furnaces. The first consignment from these works has been shipped. Germany is paying in sterling at the rate of £11 ($51.15) per metric ton and the Rimamurany works have advanced their prices by 35 per cent. Bars are being sold at 292,000 Hungarian crowns ($64.92) per metric ton, bands 355,000 crowns ($78.81) per ton, sheets under 1 millimeter, 486,000 crowns ($107.89), galvanized sheets 868,000 crowns ($192.69), and wire 415,000 crowns ($92.13).

Before the war Roumania supplied

400,000 tons of iron ore from which 200,000 tons of pig iron was obtained. The bulk of the ores came from that part of prewar Hungary which now belongs to Roumania. The production of pig iron in this territory now amounts to about 40 per cent of the prewar figure. A German firm has undertaken the construction of a large works in Roumania for the repair of rolling stock. At present only 40,000 of an available 85,000 railway cars in Roumania are in a good condition.

The Bulgarian government has placed an order with the Belgian firm of John Cockerill Soc. Anon. for the supply of rails and railway material to the value of over 3,000,000 francs.

Japanese Prices Falling; Market Inactive

Foreign Special Service

TOKIO, Japan, April 19.—The iron and steel market in Japan continues to react, prices having fallen rapidly. Speculative interests have had to unload their stocks. Indian iron which was held off the market for some time is again appearing as a menace to the Japanese furnace.

The boom which has collapsed lacked substantial foundation. Its primary prop was the Ruhr problem, and was not any improvement in the position of iron and steel users in Japan. How precarious the position of melters and machine makers in Japan is can be seen from the fact that a majority of them still have their shops closed down entirely or partially. Only some of those which make cement mill equipment or cast iron pipe are employed to capacity. They have just lodged a petition with the Japanese government asking for tariff protection. The successive price advances in the iron and steel have forced them out of the market.

The Bank of Japan opposed over expansion and through its deflationary policy credit has become harder, forcing speculative enterprises in the iron and steel trade to stop buying. The visible stock reported short has been increased as speculative holders have withdrawn. Stocks of rods, tin plate, nails, sheets, galvanized sheets, and other products are plentiful. Indian furnaces which have been compelled to keep out of the Japanese market partly because of the rise in the value of the rupee and partly due to the decline in the price of iron in Japan have sold at Kobe and Tokio in the last few days no less than 14,000 tons at 57.50 to 58 yen ($28.19 to $28.42) per ton. There is a strong possibility of another large increase of pig iron stocks in Japan.

The reactionary tendency which was foreshadowed some time ago is now fully developed. Holders of steel shapes, tin plates and galvanized sheets are unloading their stocks and prices are lower. In the pig iron market No. 1 Japanese is quoted at 70 yen ($34.30) per ton; No. 2, 65 yen ($31.85) and No. 3, 60 yen ($29.40). No. 1 Hanyang (Chinese) is quoted at 65 yen ($31.85). Cleveland iron (British) is 92 yen ($45.08). In the steel market round, flat and square bars are quoted at 5.50 yen ($2.69) per 10 kwamme. Sheet are 8.50 yen ($4.16) per kwamme and plates 4.80 yen ($2.35). Ten kwamme equals 82.67 pounds. Tin plates are slackening off in spite of packers' anticipated seasonal buying. Tokio holders naming 18.50 yen ($9.06) per box of 100 pounds. Nails have been reduced 20 yen ($0.09) to 16.80 yen ($8.23) per keg.

Yen—$0.49

Henderson Steel of Uniontown, Pa., was appointed ancillary receiver of the South Connellsville Coke Co., with an office at Cheat Haven, Fayette county, in United States District court yesterday. His bond was placed at $15,000. A petition for ancillary receiver presented by counsel for George W. Thompson, a stockholder, avers that an ancillary receiver is necessary to the preserve the state. The company owns property in Pennsylvania and West Virginia. A receiver was appointed March 1.

Scrap Prices Still Drop

(Continued from Page 1276)

and Mahoning valley districts. Absence of consumer buying is responsible for this, practically all transactions being between dealers covering on contracts. Rigid inspection and unusually numerous rejections as a result are reported, consumers becoming more and more insistent upon better quality. Quotations on practically all grades have been marked down 25 cents to 50 cents within the past few days. The one exception is malleable, which is unchanged and firm.

Quotations Continue To Soften

Cincinnati, May 1.—Local iron and steel scrap demand is quiet, with practically no sales being made. Prices continue to soften and during the past week practically all items on the list declined from 50 cents to $1 a ton. Consumers are not completely out of the market, as they are inquiring from time to time regarding prices. Heavy shipments of scrap are being forwared on contracts, but buyers are careful and many rejections are met. Heavy melting steel is being offered fairly freely at $21 a ton and is being refused by consumers at that figure as well as by dealers, who are buying to apply on their contracts. Railroads continue to offer big lists, despite the fact they are bringing less than a month ago. While demand has dropped the principal factor for weakness at this time is the increasing volume of supplies. An important factor underlying the market is the heavy production of pig iron. When mills are approached on scrap they generally say they are well provided and this probably means that they have so much pig iron they hardly need to consume the usual production of scrap.

Demand Slumps Further

St. Louis, April 30.—Except for small lots to fill in with and immediate shipment, the industries are out of the market for scrap iron and steel. Conditions are duller than in months, with the downward trend of prices still in evidence. About the only trading current is between dealers. The steel mills are well covered for the next month to six weeks. There is still an active demand from one steelmaker for specialties. Stove and job foundries are not buying at the moment. Rolling mill grades are stagnant.

Arrivals of railroad scrap are fairly large but shipments by country dealers have tapered off with the recent break in prices. Offerings by the carriers are liberal, including the following lists: Pennsylvania southwestern region, 8000 tons; Missouri, Kansas & Texas, 1500 tons; Chicago, Burlington & Quincy, 5000 tons; St. Louis & San Francisco, 3500 tons; International & Great Northern and Texas and Pacific 2000 tons and Big Four an indefinite amount. In the main price lists remain unchanged, but a number of items could be had under current quotations. Old car wheels were lowered $1.50 and railroad grate bars are off $1 per ton. The demand from outside points has quieted considerably during the past two weeks.

Weakness Is Shown

Birmingham, Ala., April 30.—The scrap iron and steel market in the Birmingham district is not as strong as it has been. Dealers believe the lull is temporary. Quotations show some weakness. Heavy melting steel in the Birmingham district is an uncertain quantity and dealers are unable to maintain quotations. Stocks of old material on hand are sufficient, the policy of buying in as quickly as tonnage is moved out still being maintained.

Many Grades Marked Down

Philadelphia, May 1.—The iron and steel scrap market here continues weak. Heavy melting steel and numerous other grades have been marked down from 50 cents to $1 during the week. While buying is substantial in all grades, dealers are beginning to complain of the difficulty of getting scrap from producers at prices yielding a profit at the present market. Producers are claiming scrap prices are lower in proportion than other commodities and in many cases are refusing to sell.

Declines Radiator Orders

The United States Radiator Co., Detroit, has instructed its salesmen to accept no orders for radiation for delivery prior to July 1, as the entire production is contracted for until after that date. In view of the fact the sliding price scale of the company will automatically increase the price of radiation about 1½ per cent on May 1 and about 2 per cent on July 1, means the future business of the company will be accepted on an increasingly profitable basis although prices on radiation are estimated to be about 25 to 30 per cent higher than prevailed a year ago.

Foundry Convention in Progress

Early Sessions of Twenty-seventh Annual Meeting of American Foundrymen's Association Indicate Growing Interest in Problems of Castings Production —Attendance Records May Be Broken as Registration Mounts

CONFIDENCE in the business outlook of the foundry industry was reflected in the papers and discussions at the first session of the twenty-seventh annual meeting of the American Foundrymen's association now in progress in Cleveland. This feeling seems to be founded not only on the promising indications for continued prosperity but also on the keener study of technical problems involved in the various scientific investigations now under way in the industry. Moreover, the program indicates a degree of co-operation between federal technical bureaus, national engineering and trade associations and manufacturers and consumers of metal products that probably has never before been attained in this country.

That unusual interest has been aroused in this meeting is indicated by the fact that the registered attendance mounted to a high figure early in the convention. On Saturday night, after the foundry exhibition had been in progress only a day, the number of persons registered approached the 1000 mark. By Monday night it was approaching 2000 and early Tuesday had passed that figure.

While the display of foundry and metal-working equipment, described elsewhere in this issue, opened Saturday, the first sessions of the technical program were not held until Monday afternoon when simultaneous meetings covering problems of steel, aluminum and aluminum alloy foundry practice were held in Hollenden hotel.

The session on aluminum and aluminum alloys was held Monday afternoon under the auspices of the American Foundrymen's association and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. The various papers presented at this session emphasized the growing importance of aluminum in the production of motor cars and other products. The contraction and shrinkage of aluminum alloys was discussed by Robert J. Anderson, United States bureau of mines, Pittsburgh. J. D. Edwards and C. S. Taylor, Aluminum Co. of America, New Kensington, Pa., read a paper on properties of magnesium, while W. A. Mills, Alloy Foundry & Machine Corp., New Rochelle, N. Y., presented a paper on methods of casting aluminum radiator shells. One of the features of this session was the presentation of a paper on "Aluminum in Light Alloys" by R. de Fleury, France. This is the annual exchange paper to the American Association from the Association Technique de Fonderie.

Discuss Steel Foundry Problems

At the steel foundry session held on Monday afternoon, C. S. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa., presided. "Production of Light Steel Castings for Ordnance Work," was the title of a paper presented by Major Minton Watertown arsenal, Watertown, Mass. The speaker described the foundry practice in use by the government. A. D. Williams, consulting engineer, Cleveland, read a paper "Heat Generation in Open-Hearth Practice" in which he discussed fuels. He used the graphic method for comparing fuels and determining their applicability to various uses. As a rule, liquid and gaseous fuels are more desirable than the solid fuels. William McConway, McConway & Torley, Pittsburgh, presented a paper on "Centrifugal Casting of Steel." The molds and casting machinery were described by lantern slide sketches. Moving pictures were used to show how the steel is cast, revolved under hydraulic pressure until it is solidified, conveyed to the soaking pit and then broken down on the forging presses to produce various sections. "Application of the Microscope and Camera to the Study of Steel Molding Sand", was the title of an illustrated paper presented by H. W. Dietert, engineering experiment station, University of Illinois, Urbana, Ill. Photomicrographs were shown to illustrate the permeability, bond, and nature of the casting surface of the sand. This method of sand study offers possibilities for more intelligent preparation and reclaiming of sand.

A. H. Jameson, Plainfield, N. J. chairman of the steel castings committee reported for that committee. With a vote for final adoption of the A.S.T.M. specification A 87-22T, tentative specification for carbon steel castings for railroads expected at the June meeting of the American Society for Testing Materials, the society with the co-operation of the American Foundrymen's association has prepared a revision of the standard specifications for steel castings A 27-21. This latter will also be voted upon at the June meeting. In addition, the Federal Specifications board has submitted to various government departments a steel castings specification drawn up after consultation with the American Foundrymen's association.

Purchasing Agents To Meet in Cleveland

Speakers of note are included on the program for the eighth annual convention of the National Association of Purchasing Agents to be held in the new public auditorium, Cleveland, May 14 to 18. Papers delivered at the various sessions will cover problems of the purchasing agent, general business conditions and outlook for the future in many industrial lines. William A. Durgin, department of commerce, Washington, will deliver a special message from Herbert Hoover, secretary of commerce.

An exhibition or "Informashow" will be held in connection with the convention, it being conducted in order to enable the purchasing agents to see the products of various manufacturing concerns demonstrated and to provide time for a study of the merits of competing commodities. An extensive program has also been arranged for inspecting industrial plants in Cleveland. Entertainment will be provided for the ladies attending the convention.

Puddlers' Wages Advanced to $12.12 Per Ton

An advance of 50 cents a ton for puddlers employed in the mills represented by the Western Bar Iron association is announced for May and June, the new rate being $12.12 a ton. The rate at the peak in January and February, 1921, was $18.70, while the general average for 1914 was $5.60. Mill crews will receive an advance of 5 per cent for May and June, bringing their wage rate to 64 per cent above base. The average selling price in March and Aprjl for bar iron was 2.35c per pound, compared with 2.25c for the two months preceding. Following are further comparisons of average selling prices, on which wage rates are based:

	1923	1922	1921	1920	1919
Jan.-Feb. ...	2.25c	1.60c	2.80c	2.55c	3.10c
Mar.-Apr. ...	2.35c	1.50c	2.55c	2.70c	2.75c
May-June ...	....	1.60c	2.30c	3.00c	2.50c
July-Aug. ...	....	1.70c	1.85c	3.25c	2.50c
Sept.-Oct. ...	....	1.95c	1.70c	3.40c	2.50c
Nov.-Dec. ...	....	2.20c	1.65c	3.55c	2.50c
Yearly av'ge		1.76c	2.14c	3.08c	2.64c

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Conservative Price Policies Shown

RECENT advances by the Steel corporation in the prices of steel bars and structural shapes have lifted the schedule of the leading producers in these products above the industrial board basis of March, 1919, and therefore to the loftiest level since the war, it was pointed out in last week's IRON TRADE REVIEW. Subsequent advances in other products the past week have raised the question how closely the industrial board schedule, on the whole, has been approached by the prevailing quotations of the leading producer. In this connection it needs to be recalled that after committing itself on March 21, 1919 to the adoption of the recommended prices of the industrial board of the department of commerce, the Steel corporation with minor exceptions, faithfully maintained that basis throughout 1919 and the active market of 1920. During the same period independent producers under force of the heavy demand raised their schedules on principal products $15 to $20 per ton on the average above the industrial board figures.

A comparison of the present prices quoted by the Steel corporation on leading finished steel products and those adopted at the initiative of the industrial board four years ago are as follows:

	Present Price	Industrial Board Schedule
Merchant bars	2.40c	2.35c
Structural shapes	2.50c	2.45c
Plates	2.50c	2.65c
Blue annealed sheets	3.00c	3.55c
Black sheets	3.85c	4.35c
Galvanized sheets	5.00c	5.70c
Hoops	3.15c	3.05c
Plain wire	2.75c	3.00c
Wire nails	3.00c	3.25c
Steel pipe	62 off	57½ off
*Tin plate	$5.50	$7.00

* Per base box.

It will be seen from this compison that apart from merchant bars and structural shapes, hoops is the only finished material, the present price of which is above that of the agreed schedule. In plates the spread in favor of the March, 1919 schedule still is $3 per ton, in blue annealed sheets $11, in black sheets $10, in galvanized sheets $14, in tin plate $30, in plain wire and wire nails $5 and in steel pipe approximately $9.

The point to be stressed from this examination is that the advance in steel prices on the whole up to this time has been truly conservative as best can be judged from postwar standards, and notwithstanding the fact that the prevailing demand for steel is the greatest of any peacetime period in history. Steel prices today on the average are $6 to $7 per ton below the schedule which representatives of the government, desirous of protecting both buyers and sellers, decreed to be fair and equitable in the immediate postwar days. Many of the conditions affecting steelworks cost and production which the industrial board took into account four years ago in determining its prices are equally applicable today. Bearing on this point, the industrial board's price on basic pig iron was $25.75 furnace whereas the present open market is $31.

Another encouraging aspect of the situation now ruling is that the Steel corporation's schedules in large part are being closely followed by representative independent mills. None of that disposition to quote the market as high as the demand would bear, which was followed by most of the independent producers in 1919 and 1920, is apparent today. This further emphasizes the caution and restraint in naming prices which producers generally recognize as essential to the prolongation of the present extraordinary market.

Industrial Production at High Tide

OPINIONS may differ as to how long the present high activity in industry and commerce will cntinue, but there can be no disputing the fact that at present industry in the United States is moving at a phenomenal gait. Those critics who feared it would take the consumptive capacity of the country years to catch up with the expansion in prodution com-

pelled by war needs have been confounded.

In its monthly survey of business the bureau of labor statistics ascertains the percentage of plants of a given industry operating at full time. In March the bureau found 100 per cent of the hardware, piano and organ, petroleum, and electrical machinery and appliance plants operating at capacity. The percentage of fulltime operations by some of the other industries follows: Steel shipbuilding, 99; cotton manufacturing, 98; agricultural implements, and paper and pulp, 97; car building and repairing, 96; men's clothing, cotton finishing, and shirts and collars, 95; carpets, and meat packing, 94; automobiles, baking, boots and shoes, furniture, and woolen manufacturing, 93.

But these are only a fraction of the 43 industries covered by the bureau. Out of 43 separate and distinct industries the bureau learned that 26 reported 90 per cent or more of their plants operating fulltime. In only 11 of the 43 industries were fewer than 80 per cent of the component plants operating at less than absolute capacity. And apparently, the nearer an industry approaches the point where its products may be said to represent the power of the public to buy luxuries or near-luxuries, the more nearly it is operating at 100 per cent. The future is a hazard only for prophets but anyone may read the present prosperity of industry.

American Imports On Increase

THE rising tide of imports into the United States tell a story of increasing prosperity and expanding consumptive demand. The belated figures for February, just made public by the department of commerce, show foreign purchases of $296,000,000. This was the largest volume of February imports for any year in the country's history save in 1920. The gains are largly accounted for by greater imports of crude materials and partly manufactured articles for further use in manufacturing. This reflects the intense domestic industrial activity.

When imports are compared with February exports of $307,000,000 it is found that the excess of exports was only $11,000,000. Nothing like this small balance of trade has happened since a few months in 1914. Adding the net gain of February gold imports amounting to $6,983,000 to the total of merchandise imports reduces the visible balance of trade to the extremely narrow margin of $4,017,000 for the month. Unquestionably this margin is entirely wiped out by the invisible items which are running against this country. Tourists alone will spend many millions of dollars abroad this summer.

Manifestly the time, long predicted, has now arrived when the international trade balance is flowing against this country. This is a logical development for a country to which the world is indebted to the extent of some $15,000,000,000 and which holds 40 per cent of the world's monetary gold stocks. Prosperity and rising prices here and the large buying power of the dollar abroad are stimulating imports. The protective tariff has not stemmed this tide, largely because the fluctuating portion of imports likely to be affected by tariff duties, amounts to only about 6 per cent of the total volume.

The imports situation contains no threat of unfavorable possibilities. The export trend is less reassuring. The falling off of the European demand for agricultural products is a particular point of weakness in the outlook. Normally one-third of the country's wheat crop and approximately one-half of the cotton output must find foreign markets. March cotton exports were 33 per cent below those for the same month in 1922. In the eight months ended with February, foodstuffs exports amounted to 27 per cent of total exports compared with 33 per cent one year ago.

The weakened purchasing power of Europe is responsible for diminished buying of agricultural products. This is causing an unbalanced domestic condition with prices of farm products, with some exceptions, continuing out of line with the general price structure, that spells impairment of the farmer's purchasing power. This outlook is offset, somewhat by growing indications of improvement abroad.

Great Britain Regains Lead

BRITISH steelmakers are deriving much satisfaction from the fact that Great Britain after a lapse of 13 years was able in 1922 to restore its leadership as the largest shipper in the iron and steel export market. According to data now available, British mills and furnaces in 1922 exported a grand total of 3,551,000 gross tons. The nearest rivals among other countries were Germany with 2,368,000 tons, a surprising total considering the disturbed industrial and financial conditions of that country, and the United States with 1,988,000 tons. These figures make out the United States a rather poor third in international iron and steel business.

After having led the world for many years as the leading furnisher of iron and steel in international trade, Great Britain was passed in 1910 by the vigorously expanding German industry. Germany held this position until the outbreak of the world war. The climax of its foreign trade volume was reached in 1913 just before the war with a total of approximately 6,500,000 tons including scrap against approximately 5,000,000 tons for the United Kingdom and 2,745,000 tons for the United States.

Only during the war period and in the two years immediately following has the United States assumed the first position in tonnage in the steel export field. In 1921 this country and Germany were practically on an even basis. It was not until 1922 that Great Britain's recovery reached into full swing.

Pause in Buying Not Disquieting

Constructive Factors Still Dominate the Outlook—Plants in Many Lines Operate at Maximum—Lull in Ordering Avoids Dangerous Excesses—Steel Industry in Profitable Era—Car Shortage Drops

BY JOHN W. HILL, FINANCIAL EDITOR

CONSTRUCTIVE factors still dominate the outlook. This is true despite the uncertain waverings of speculative markets and the pause in forward buying in many industries. The purchasing movement in the first quarter was of prodigious proportions and needs were largely covered for some months ahead. Production is now at the maximum and the only result of continuance of feverish buying would have been runaway markets, duplicate orders and other unhealthy concomitants of a hectic shortlived boom.

The present lull, therefore, reflects soundness and not weakness. If the present business conservatism prevails there is little ground for the pessimism now apparent in professional speculative quarters. Buying power is large and consumption is growing. As a result when producers work down the present accumulation of orders, substantial buying should be resumed. The railroads have a program of improvements calling for $1,100,000,000. The building industry apparently is gathering speed in spite of higher costs. Large crops, somewhat higher prices, and low production costs in 1922, are enabling the farmer to buy although the purchasing power of his dollar in terms of other commodities is only 69 per cent of 1913, as shown in the Business Trend. Cotton and wool growers are not suffering and if present indications of improvement in Europe materialize healthy markets for surplus foodstuffs should result.

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Steel Output Per Capita	Feb. 1
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Long Time Trend of Wages	Aug. 3

Save for a few cotton mills and in the petroleum industry there has been no letdown in industrial activities. Production of basic commodities in March increased 4 per cent to 8 per cent above the 1920 peak and 67 per cent above the 1921 low point, according to the federal reserve board's index. The phenomenal recovery has been unaccompanied by any strain upon credit. Last week the cash ratio of the federal reserve system went to 77 per cent, a new high for the year. Loan rates may work higher but there is no danger of credit stringency.

The flood of first quarter income statements from leading steel companies brought unmistakable evidence that the industry has entered an era of profitable operations. With production under tremendous momentum it is probable that earnings will continue to climb for some time to come. Low priced orders have largely been delivered and higher wages should be absorbed by better current prices.

That consumption and distribution of goods has not slackened is indicated by the gain of car loadings for the second week of April to the largest total since November. Of even greater significance, the net car shortage was the smallest since September. This reflects the large amount of new equipment being placed into use by the roads. One tangible result is seen in rising earnings, which in March are estimated at 12 per cent above one year before.

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	1913
Business failures	358	418	356	543	328
Cash ratio Fed. Res. System	77	75.5	75.5	78.3	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5-5¼	5-5¼	5-5¼	4½	5-5½
Aver. 20 ind'l shares	$96.46	$96.83	$99.35	$88.66	$79.25
Aver. 20 rail shares	$86.29	$87.01	$87.18	$83.86	$108.50
Ave. 40 bonds	$77.33	$77.25	$76.68	$80.46	$93.00
Car loadings (week ended April 14)	946,759	895,167	904,286	700,604	601,695
Bank debits 242 cities (000 omit'd)	$9,452,811	$10,322,209	$9,165,744	$9,099,134	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	May 1 (close)	Week before	Mo. ago	Yr. ago
Sterling	$4.86	$4.63	$4.65	$4.67	$4.42
Francs	19.3c	6.73c	6.65c	6.66c	9.18c
Lira	19.3c	4.89c	4.94c	5.02c	5.30c
Marks	23.8c	0.0035c	0.0047c	0.0047c	0.35c

MONTHLY COMPARISON

	March	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$334,000,000	$235,000,000	$292,000,000	$71,450,000
Business failures:				
Number	1682	1508	2463	1336
Liabilities	$48,000,000	$40,627,000	$71,608,000	$22,723,000
Exports	$350,000,000	$307,106,000	$329,979,000	$207,000,000
Excess of gold imports	$5,559,257	$6,983,647	$32,524,000	*$630,716
Bureau of Labor Price Index	159	157	142	100
Bradstreet's Price Index	150.1	153.7	125	100
Economist's British Price Index	4392	4402	4297	2717
Cost of Living Index	159	157.5	154.7	100.0
New incorporations	$500,819,000	$700,708,000	$731,866,000	$172,301,000
Railroad net earnings	‡$38,903,000	$60,654,000	$47,727,000	$59,900,000

‡February. *Monthly average export excess.

The Business Trend

May 3, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Evidences continue of slackening in the increase of industrial activities and quieter buying for future delivery in numerous lines; lull is natural after extended period of aggressive activity; most industries filled with orders for weeks or months ahead; consumption climbing.

FARMER PURCHASING—Buying ability of farmer still ascending as crop values rise; farmer's crop and live stock dollar commands only 69 per cent of 1913 dollar but large crops give greater gross incomes.

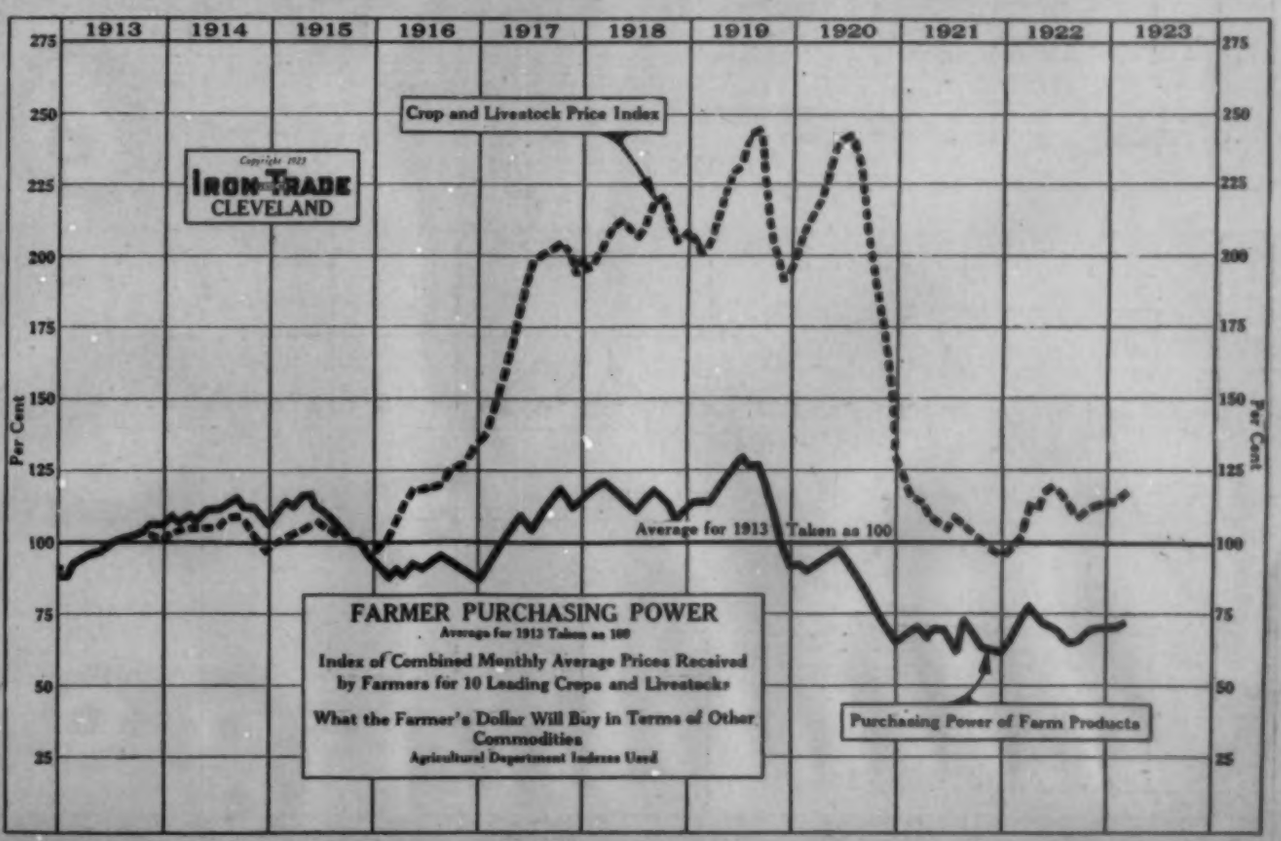
COPPER—Market for copper continues quiet; largely due to reduced European buying; domestic consumption at new high peaks.

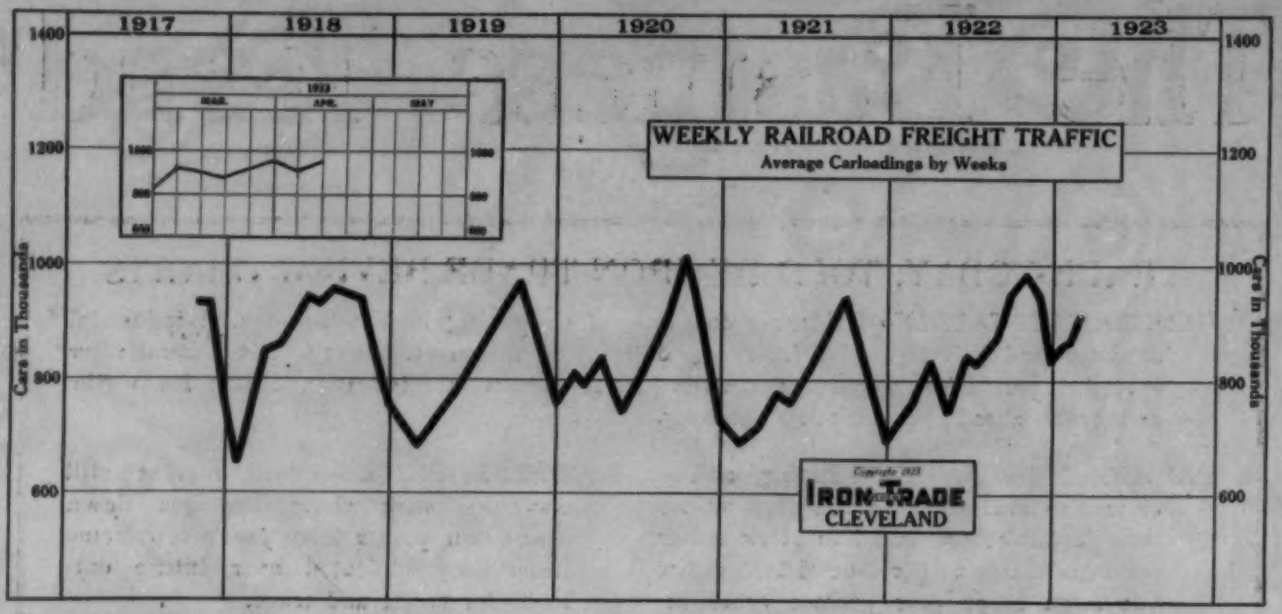
TRAFFIC—Car loadings for week ended April 14 increased over 50,000 to largest total since November; 30 per cent above same week in 1922; roads cut net car shortage to smallest figure since last summer.

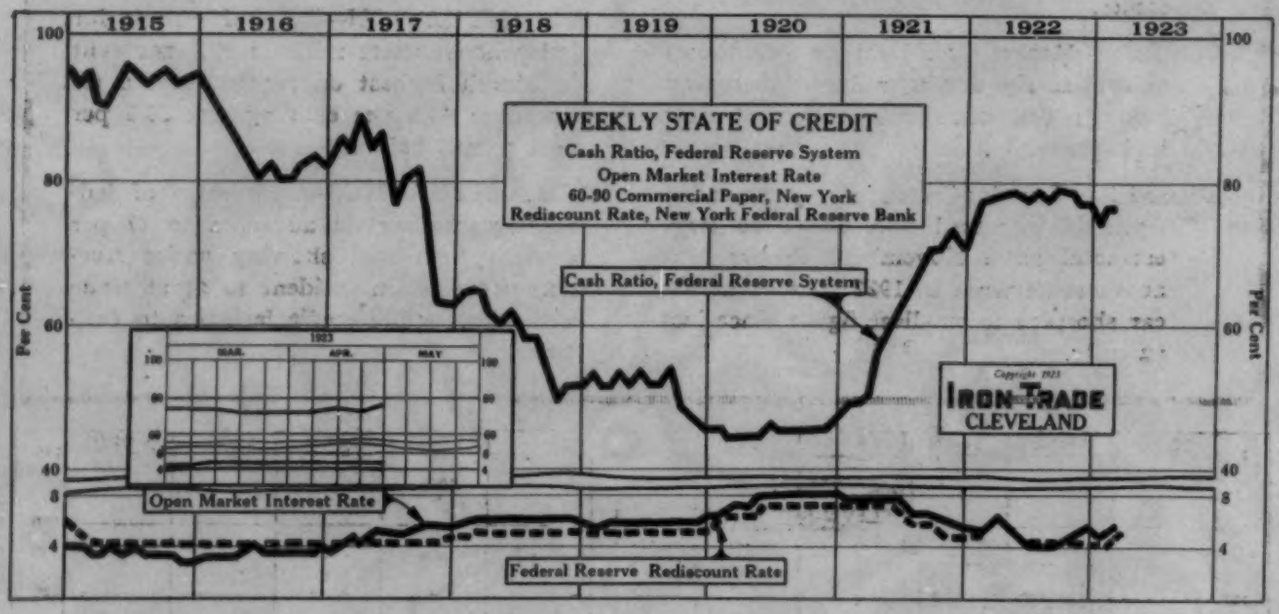
SECURITY PRICES—Stock market still wavering with share averages down about four points from year's top; some uncertainty indicated over future outlooks for credit and trade.

SHEET SITUATION—Rate of output for independent sheet mills of 92.7 per cent in March highest on record; stocks reduced to 45.1 per cent against 55.5 per cent month before.

CREDIT SITUATION—Cash ratio of federal reserve system advances to 77 per cent; system still showing entire freedom from strain incident to great trade activities; ample credit facilities to continue.




1917
1918
1919
1920
1921
1922
1923
1400
1200
1000
800
600
Cars in Thousands
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
1923
MAR.
APR.
MAY
IRON TRADE
CLEVELAND


1915
1916
1917
1918
1919
1920
1921
1922
1923
100
80
60
40
8
4
Per Cent
WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
Cash Ratio, Federal Reserve System
Open Market Interest Rate
Federal Reserve Rediscount Rate
1923
MAR.
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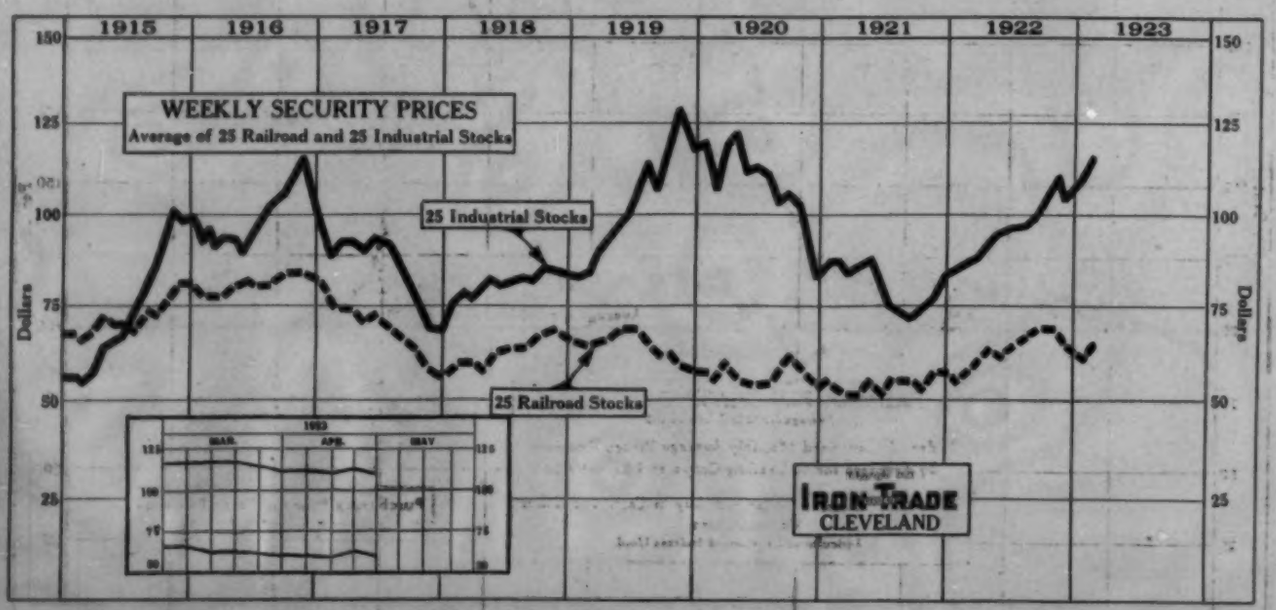
IRON TRADE
CLEVELAND


1915
1916
1917
1918
1919
1920
1921
1922
1923
150
125
100
75
50
25
Dollars
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
1923
MAR.
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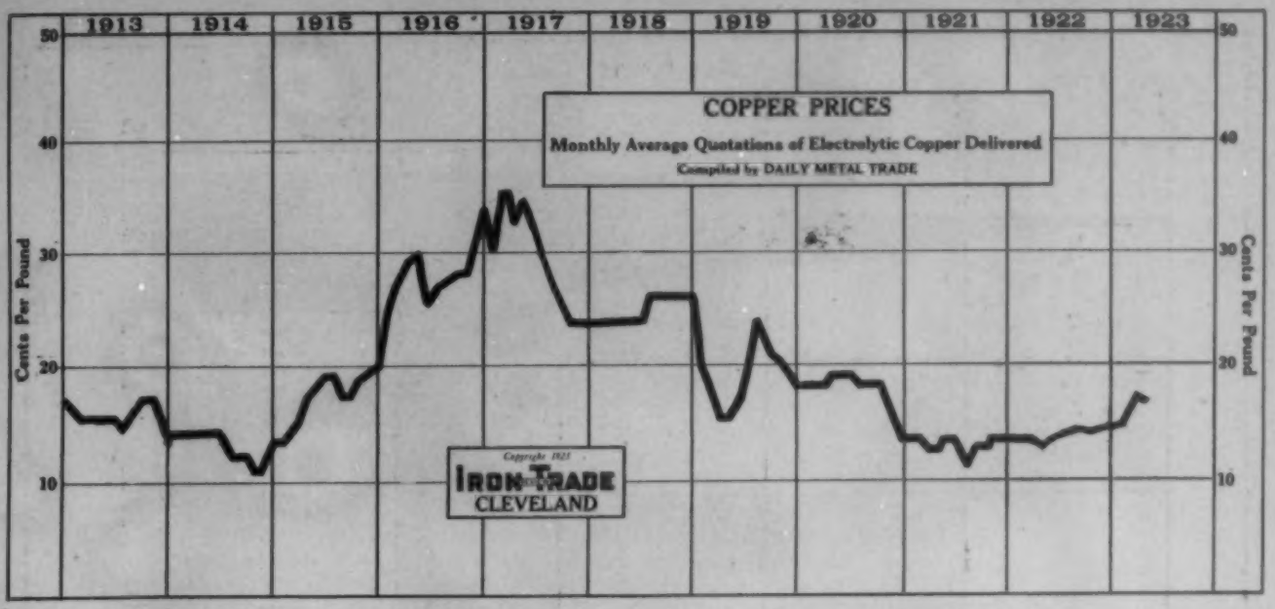
MAY
IRON TRADE
CLEVELAND


1913
1914
1915
1916
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1918
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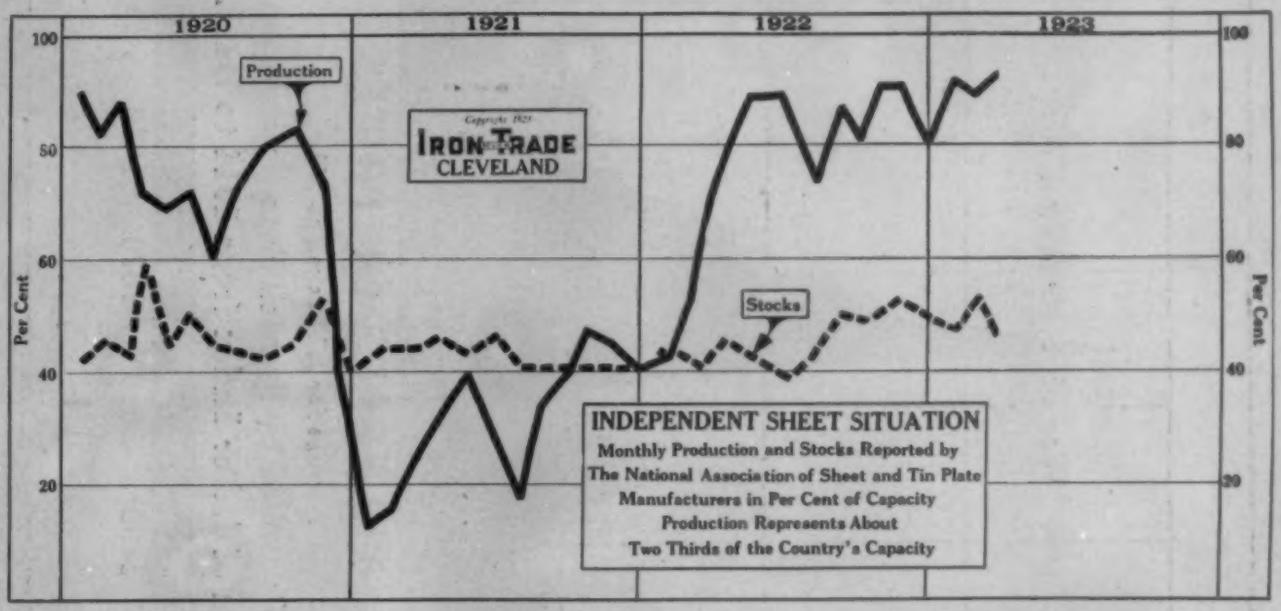
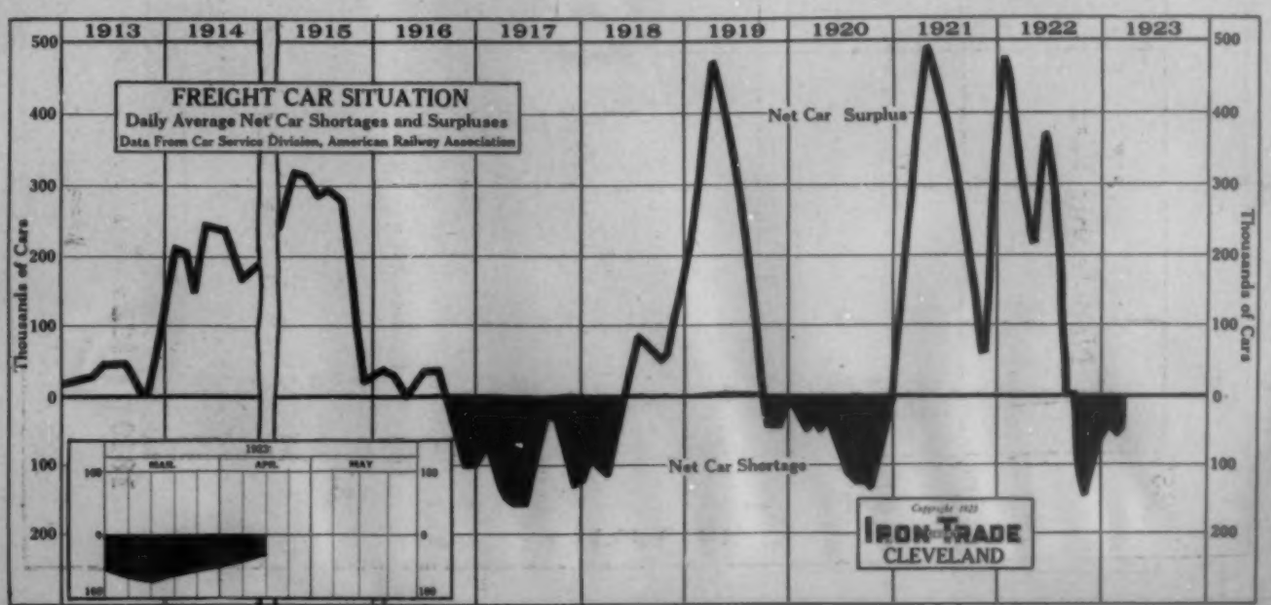
1920
1921
1922
1923
COPPER PRICES
Monthly Average Quotations of Electrolytic Copper Delivered
Compiled by DAILY METAL TRADE
Cents Per Pound
50
40
30
20
10
IRON TRADE
CLEVELAND


1920
1921
1922
1923
Production
Stocks
Per Cent
100
80
60
40
20
IRON TRADE
CLEVELAND
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by
The National Association of Sheet and Tin Plate
Manufacturers in Per Cent of Capacity
Production Represents About
Two Thirds of the Country's Capacity


1913
1914
1915
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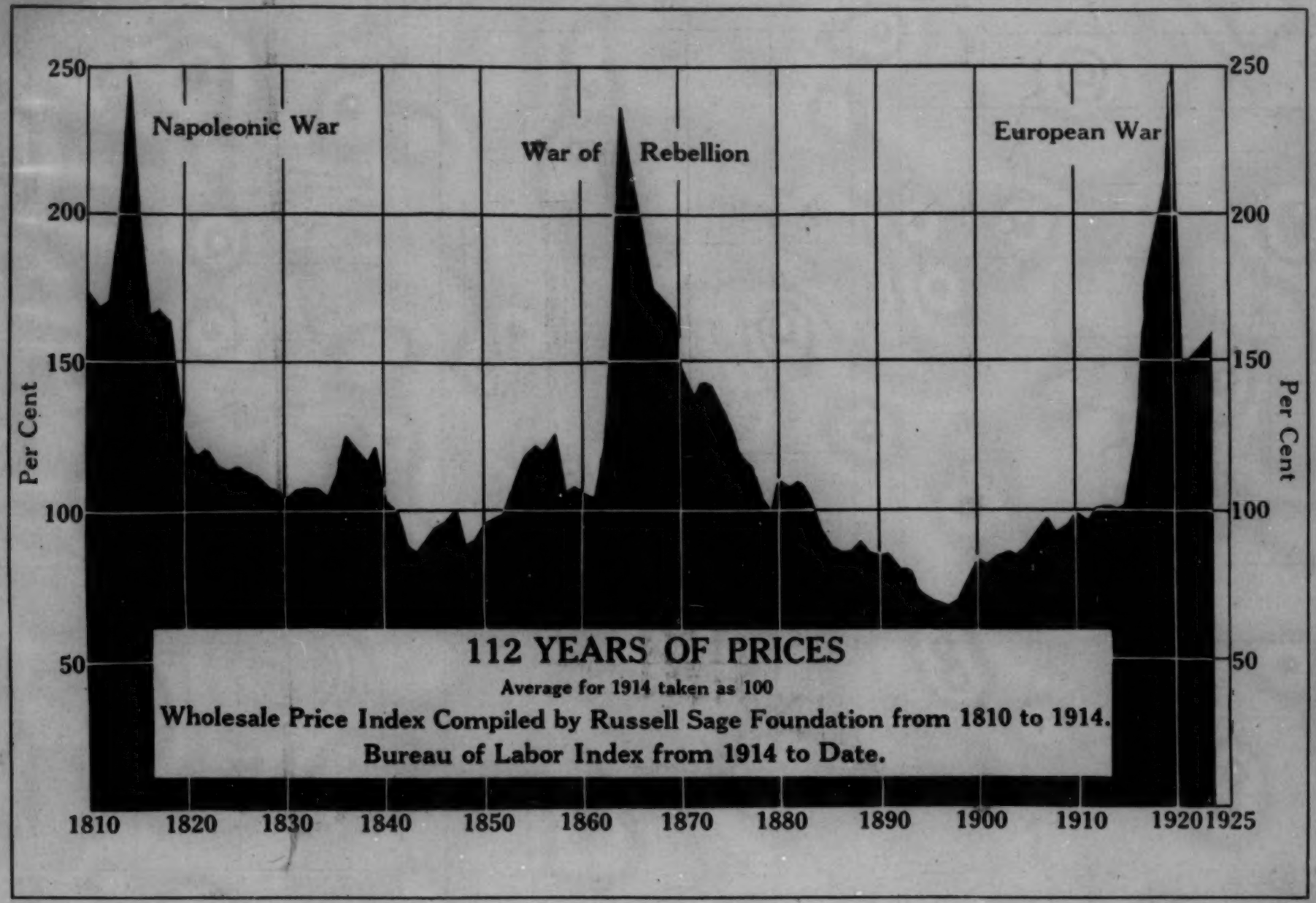
1918
1919
1920
1921
1922
1923
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
Thousands of Cars
500
400
300
200
100
0
100
200
1923
MAR.
APR.
MAY
IRON TRADE
CLEVELAND



112 YEARS OF PRICES

Average for 1914 taken as 100

Wholesale Price Index Compiled by Russell Sage Foundation from 1810 to 1914.
Bureau of Labor Index from 1914 to Date.

Casting Iron in Long-Life Molds

Thin Sectioned Castings Are Produced in Metal Molds Provided with Suitable Refractory Surfaces—Output Is Increased by Machine Equipped with a Number of Mechanical Features—All but Pouring Operation Is Automatic

BY RICHARD MOLDENKE

DESTRUCTION of the mold every time a casting is poured is an inefficient procedure. The making of molds which could be used over and over again dates back to the bronze age, when implements of warfare and domesticity were made in stone molds, the two parts of which were suitably hollowed out, clamped together and poured much as are our present brass ingots. These stone molds are in reality the first long-life molds on record. In the development of the iron industry, the open-sand mold was the only practical means of caring for the intermittent supply of metal from the blast furnace. As time went by, however, and the iron foundry became stabilized, the desire to construct molds which would last for more than one filling without damage asserted itself again and as early as the opening of the last century we have English patent records bearing upon the subject.

While the iron mold, or as we know it under the title of permanent mo'd, has been known and used for perhaps a century and a half, and is today attracting attention in connection with the centrifugal casting process, the method in its simpler forms never has found a solid footing in the foundry industry, the fundamental reason being that the molten metal when poured into an iron or steel mold is subjected to entirely different influences than is the case with the ordinary sand mold. The rate of cooling is so much faster, with consequent more sharply defined crystallization effects, and production of fine grain structure if not actual chilling of the metal to whiteness. Even where the attempt is made to approximate the rate of cooling as in the sand mold, by suitably preheating the iron mold, this either falls short of the desired situation if the mold is to last, or when preheated sufficiently pouring must be done at longer intervals unless the life of the mold is to be sacrificed. The consequences has been that while good castings have been made with all the permanent mold processes brought out, the irregularity of product unless corrected by careful and costly annealing has militated against their commercial success.

For ordinary work, therefore, it seems far better to return to the old bronze age idea of using the equivalent of the stone mold—in other words, a mold of the refractory surface properties of sand and yet strong enough to yield a large number of acceptable castings before considerable redressing is necessary or the mold must be discarded. This would be the long-life mold. Coming down to practical considerations, the following conditions would seem to be indicated in developing such a type of mold.

The mold surface must be of a highly refractory character so that the least possible heat may be transmitted inward to affect the form of the mold as well as seriously limit the rate of pouring iron for castings into it. If too much heat passes from the surfaces in contact with the molten iron into the body of the mold, the purpose of the mold is lost, as it no longer will approximate the regular sand mold. Again, too hot a mold will warp and deteriorate rapidly. Hence the desirability of having the mold light and if necessary air cooled, so that the mold body may not accumulate heat unduly and thus affect the rate of pouring detrimentally. The ideal situation is that of the heat conditions in the green-sand mold from which the casting has been removed just after setting—imagining this possible without destroying the mold. Only a small depth of sand will have been affected seriously

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FIG. 1—LONG-LIFE MOLDS IN POSITION ON THE ROTATING CASTING TABLE AND READY TO BE POURED. THE GAS TORCH FOR PREHEATING MOLDS IS BELOW THE HOOD WHILE THE AUTOMATIC SOOTER IS SHOWN IN THE FOREGROUND

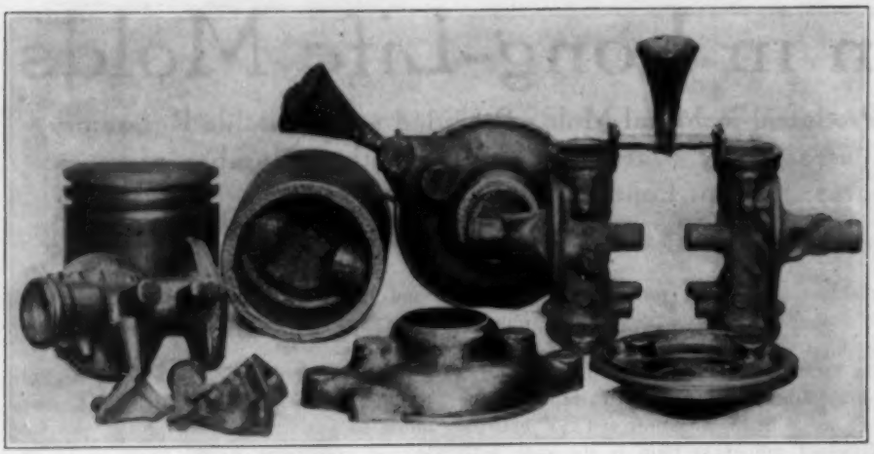

FIG. 2—SOME GRAY IRON CASTINGS PRODUCED IN LONG-LIFE MOLDS AND PARTLY MACHINED. THE PISTONS AT THE LEFT ARE EXAMPLES OF CASTINGS WITH THICKER SECTIONS

by the extreme heat, and the outer portions of the mold may still be cold.

The nature of the mold material must be such that no gases are formed during contact with the molten metal nor until this has set. There is little chance for venting in such a mold. A momentary consideration of this matter, however, will show that after all it is the fault of the mold if gases are formed which affect the metal surfaces. The chilled roll is a case in point. Here is no chance for venting whatever, and yet castings are made which machine up without a defective speck. Further, it is perfectly possible to cast against a fire brick surface successfully, provided the surfaces are perfectly dry and preferably warmed. Hence, if the casting surfaces of a long life mold are of a fine granular and highly refractory nature there need be little fear of bad results due to lack of venting.

The mold surfaces must be sufficiently strong to resist the cutting action of the molten metal and must be impervious to the entrance of fine filaments of iron which on removal of the casting would take some of the mold material with it. Further, the mold surfaces must not spall off. If thoroughly dried the last named action should not eventuate. The strength of the mold surfaces is a question of the bond, and the porosity of the material a matter of the fineness of grain or crystal.

Metal Thickness Affects Cooling

The crucial point in the above considerations as to the nature of a desirable mold surface is the rate of removal of heat from the molten metal, whether as slow as in the case of the ordinary sand mold, or fast enough to permit some chilling action. This rate of removal of the heat until the molten metal has safely set depends upon the refractoriness of the material in greatest measure, the temperature of the molten metal and the quantity of metal involved, and on the freezing point and other metal characteristics. For the various sections of a casting the temperature of any point of contact between mold surface and molten metal will be practically the same at first, but the depth to which the comparatively high temperatures will penetrate the mold mass will naturally depend upon the thickness of the metal which has to set against it.

If in a casting, a portion ¼-inch thick imparts say 1000 degrees Fahr. to a point 1/64 inch within the mold mass, another portion of the same casting 2 inches thick may show the same 1000 degrees Fahr. at a point 1/16 inch deep within the mold mass before the metal has safely set. Practically, for long-life mold purposes, it is the nature of this 1/16 inch or less, depending upon the thickness of the castings to be made, that must be carefully considered and must conform to the requirements above enumerated. The rest of the mold mass can be any material that is structurally safe to hold the refractory surface true and well bonded, and will also absorb the heat passed through the mold surface material and promptly dissipate it. In other words, a cast iron backing to a refractory mold material forming a contact surface for the molten iron, is an ideal combination when the refractory facing of the mold is heavy enough to transmit heat at the proper safe rate, and the iron backing is light enough to dissipate the heat transmitted into it quickly.

With the above underlying principles involved in the construction of the long-life mold thus enunciated, it is the purpose of the writer to show how the problem of adapting these principles for everyday practical application have been worked out into a system by the Holley Carburetor Co., Detroit, and to describe the machines built for the purpose. Some of the molds already have had 10,000 castings made in them and by reason of a close daily inspection and attention to the refractory facing material of the molds not one of them has yet had to be discarded. The term long-life is used advisedly as against permanent, for in the latter the supposition is that no repairs are made on the metal mold; whereas in the former, repairs are possible and are carried out until they no longer pay.

The system devised by the Holley Carburetor Co. has been worked out carefully and is patented. As previously indicated, the primary idea has been to make a light cast iron mold, the surface of which is covered with a layer of highly refractory material, of necessary thickness. This refractory material is so protected from abrasion and penetration of fine iron filaments that it almost wears to a polished surface and only on

FIG. 3—TWO LONG-LIFE MOLD MACHINES IN OPERATION. THE MOLDS ARE HAND POURED FROM AN ELEVATED PLATFORM

rare occasion need be patched up or refaced. For operating purposes where the castings are not large, a group of molds is placed upon a revolving table and the several steps of the cycle can be carried out almost completely automatically. Where the castings are larger and a table of three to eight molds would be cumbersome, single molds could be operated as long as molten metal is available.

The refractory forming the mold surface consists of two materials, the refractory itself, and the binder to bond it to the iron backing. The refractory material can be any of the usual substance used to resist heat in the arts. Thus, magnesia, bauxite, fireclay or kaolin will serve. The grain must be exceedingly fine and in the application heat must be used finally so that no question of gas forming constituents remaining in the mass may arise. The binder must be a mineral one, an alkali silicate being most convenient, so that when heat has been applied the mass is like a thin sheet of stone. The material is preferably put on in comparatively thin layers, and each one baked on before the next is applied. For the heavier facings, the final layers can be applied by transfer from what would be a metal pattern, so that the accuracy of the finished long-life mold leaves nothing to be desired.

Operation Practically Automatic

The final heating, in effect a skin-drying at temperatures to almost vitrify, being accomplished, the molds are placed in their proper position on the revolving table, and successively follow their prescribed course. In passing around, the two parts of the mold are drawn apart sufficiently to allow the setting of cores, but just before this each mold successively passes a flame of acetylene gas which smokes the inner surfaces heavily. The idea of this is to interpose a film of carbon between the refractory surface and the molten metal and of sufficient strength to prevent any scoring action or the actual contact of metal and refractory material. Most of the carbon is absorbed by the metal, but the effect is that until the molten metal is no longer dangerous, the refractory material is protected.

After passing the flame and the position where cores can be set, the two parts of the mold are made to close automatically and are held thus until poured off and the metal has set sufficiently. Then the molds open quickly and the castings are forced out by pins or in other suitable ways. Next, the blast of air at high pressure blows the surfaces clean and the mold passes before the acetylene flame again. The man setting the cores, or in the absence of cores, any attendant watches out for the mold surface condition as the molds pass by open, and any fragment of iron or core left in the mold is easily removed with a suitable tool.

The iron backing of the mold is comparatively thin. This allows the use of air-cooling action for cooling the iron molds. By increasing the air blast the machine can be speeded up so as to give a larger production.

Pouring Is Done by Hand

Whether pouring is done by hand or from suspended ladles; whether the man remains stationary while pouring as the mold passes him or a moving platform accompanies the table; whether the molds and cupola are together or iron has to be carried from a distance; and whether molds are poured all day long or merely the usual two or three hours, depends upon the individual conditions. It may be of interest to state that with 12 single molds on the revolving table, one man can pour 400 castings of a given kind per hour. With sand casting it requires eight times the number of man-hours to get an equal number of the same kind of castings. Further, from the nature of the pour-top pour, it is possible to feed the molds more perfectly and hence the castings made are free from shrinkage even with considerable variation in sections. This makes for denser metal and the consequent benefit to strength conditions, etc.

While the process is still in its infancy and attention has naturally been given to quantity production of the comparatively light castings, nevertheless many automobile pistons have been made also, and these involve somewhat thicker sections. It will become a matter of heavier refractory coatings, and more

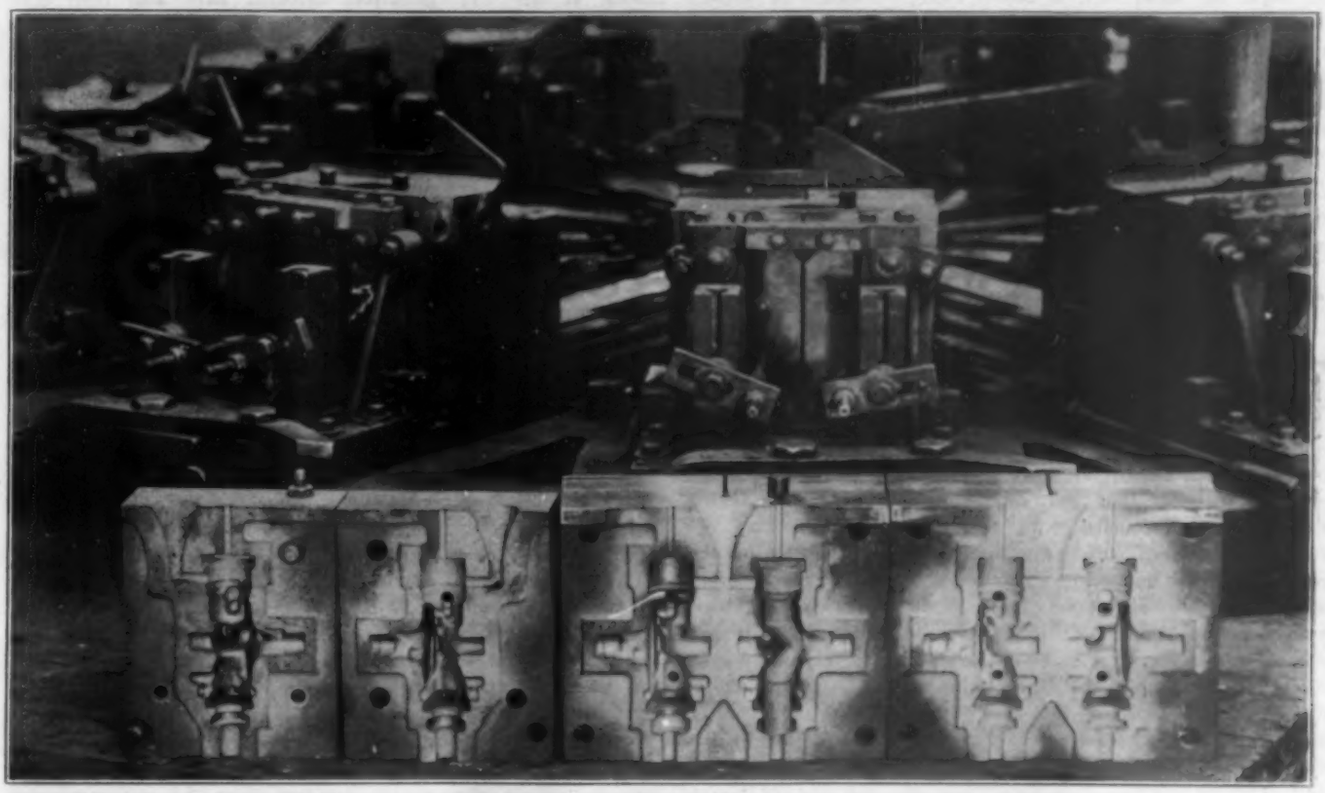

FIG. 4—A CLOSE-UP OF THE LONG-LIFE MOLDS. IN THE FOREGROUND ARE SHOWN THE PARTS FOR A ONE-CASTING AND A TWO-CASTING MOLD. ONE CORE IS SHOWN IN POSITION. NOTE THE METHOD OF GATING

frequent repair of exposed points in these coatings, when larger work is undertaken.

Of the accompanying illustrations, Fig. 1 shows a group of long-life molds arranged on the revolving table and ready for the pouring operation. On the wooden platform at its right end the mold will be noted just closing up. The next five molds will be seen as closed. Pouring is done while the molds pass the wooden platform. The metal sets properly while the table brings the molds successively to the position of the one under the last pipe at the left, where the molds open for the ejection of the castings. At the next position toward the right the mold face is blown clean, then it comes before the acetylene flame as seen directly under the hood. Here the mold face is smoked, the excess smoke being drawn away with the products of combustion. The molds are now wide open and at the extreme right of the table three molds can be seen fully open for inspection and the setting of cores. The cycle then repeats itself.

Fig. 4 shows the molds more plainly. In the foreground are a set each of one and a two-casting mold. The arrangement for pouring basin, core vents and gating is plainly shown. A core has been set in the third mold from the left. The holes in the molds directly in the spaces for the molten metal are filled with suitable pins which push inward as the molds open and thus eject the castings automatically.

Examples of Thick Sections

Fig. 2 shows some of the castings ejected from the molds and partly machined. A broken casting at the left displays a perfectly uniform, fine-grained fracture, easily machineable and without a sign of chilling. The piston casting shows some thick sections, not being cored for the pin. The pair of castings connected with the gate, at the extreme right, are interesting as being taken from the right-hand mold pair of Fig. 4. The cores have been removed.

Fig. 3 shows two of the tables in operation. Pouring off may be observed on the first table. Successful results also have been obtained by spraying the molds with a film of graphite in oil, the heat of the molds driving off the oil almost immediately. This method doubtless would be more economical for larger molds.

It has been of great interest to the writer to observe the operation of the new development. For many years he has advocated leaving the permanent mold idea in favor of the long-life mold, as giving promise of better results. The principles involved have also been discussed by the writer, but until the Holley company had worked out the problem step by step and had provided for the several contingencies mentioned in connection with the requirements of the mold surface, nothing comprehensive in this line had been available.

Melting Small Lots of Malleable Iron

BY S. J. FELTON

THE practice of melting malleable cast iron in furnaces not ordinarily used for this metal differs from the usual melting practice. Malleable iron can be melted in brass foundry crucible furnaces, but the small quantities produced, coupled with the difficulty of obtaining sufficiently high temperatures, make this method impracticable with the usual installation. High grade, free-annealing malleable iron can be melted in oil furnaces, such as are used in brass foundries, and the following discussion is based on the use of 500 and 1000-pound, horizontal, barrel-type, noncrucible, tilting furnaces using oil as fuel.

Preparing the Furnace Charge

The pig irons ordinarily used for malleable are perfectly satisfactory, but they should be of small size, and care must be used with each heat in getting representative pieces for the charge, because of the small quantities used. Plain carbon steel, malleable scrap, ferrosilicon, and ferromanganese make up the other ingredients of the charge. Naturally, materials containing chromium should be avoided. Although carbon is not absorbed by the charge, crushed coke or other forms of carbon may be added to retard oxidation of this element. Purchased malleable scrap should never be used, as the analysis fluctuates greatly, and high sulphur is liable to be encountered. Slag, burned out mill-scale, or sand, make satisfactory packing materials for annealing. If the packing material becomes oxidizing in nature, it may be neutralized by coke additions. The melting furnace may be lined with either fireclay or silica.

The time of melting will ordinarily be under two hours, and the melting losses will average about 0.40 carbon, 0.30 silicon, and 0.20 per cent manganese. As the change is rapid when the metal is hot, particular efforts must be made to cast and break fracture samples quickly, so as to catch the metal at the right point. Therefore, smaller samples and quicker cooling than is used in air-furnace practice, must be had. A sample, cast in the impression made by the end of a shovel handle and water quenched after air cooling to below a red heat, is satisfactory. Ordinarily the metal is tapped on an almost white fracture showing a slight graphite precipitate. Although according to air-furnace practice this fracture in such a small, quickly cooled, sample, would indicate high carbon and silicon, the metal changes so rapidly in the oil furnace that this fracture will give a heat analysis of about 0.90 silicon, 2.50 carbon, and 0.20 per cent manganese, if the mixture was made up taking into consideration the losses given above. The heat must be tapped quickly, and as the losses continue while the metal is being poured from the furnace, the last part of the heat should be doped with ferrosilicon unless heavy work is being poured.

Until one becomes thoroughly acquainted with the process, each heat should be analyzed as quickly as possible so as to get a line on just what the furnace is doing. Castings should also be broken to be sure that no graphite is present. The losses are liable to vary in different furnaces and with different materials charged. If the metal comes down too slowly, steel may be added to aid oxidation; if too quickly, ferrosilicon may be used. If considerable time is spent doping a heat, cognizance must be taken of the manganese loss and ferromanganese should be added. If very thin work is to be poured, it is sometimes advisable to tap on a darker fracture than the one mentioned above, while for heavy work a white fracture on a larger sample should be obtained.

Thick Ladles for Light Work

For light work, the metal must be handled quickly in thick lined ladles of not over 100-pound capacity. Unless the heats are running uniformly in analysis, the scrap for each heat should be kept separate, as fairly close figures on the mixture to be charged must be obtained in melting such small quantities of metal. If larger amounts of metal are needed, several furnaces may be run at the same time. This puts quite an analytical burden on the laboratory, but when heats are running smoothly, and the same materials are being charged, it is possible to obtain uniform results if a single silicon or carbon is run on each heat, provided a complete analysis is obtained on one heat from each furnace every day. Be-

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fore this method is adopted, however, one should be expert at drawing deductions from the fracture samples, and the furnaces must be well understood. The phosphorus and silicon should run under 0.20 and 0.05 respectively, and they remain practically constant during the heat. It must be admitted that the methods of sampling and analysis stated here probably seem somewhat haphazard to a strictly up-to-date malleable man, but the exigencies of the process necessitate just such procedure, and the uniformity of metal obtained under these conditions is surprising.

Caution Against Rapid Heating

Oil-furnace malleable is a free annealing iron, thus soaking at 1600 degrees Fahr., for 48 hours and cooling at 10 degrees per hour gives complete annealing. In many instances quicker annealing than this is satisfactory. Off-analysis metal anneals more readily than air-furnace iron of the same analysis, but naturally in most cases, unless the analysis is correct, the metal suffers in physical properties. Practically any fuel which will maintain a temperature of 1600 degrees Fahr. in the furnace is satisfactory. Some foundrymen caution against heating too rapidly, but the author has used oil as a fuel in a 5000-pound furnace which reached 1600 degrees Fahr. in 10 hours, but the castings in the boxes, packed in mill scale, did not attain 1540 degrees Fahr., their maximum temperature, for 32 hours after after starting. It is interesting to plot a cooling curve, comparing the temperature of the castings with furnace temperatures. The furnace may cool at an average uniform rate of 10 degrees per hour while the castings cool at an average rate of 8 degrees per hour. The slope of the castings temperature curve will be closer to the horizontal than the furnace temperature line on account of heat evolution from the precipitation of proeutectoid graphite. From 1350 degrees Fahr. to 1200 degrees Fahr. the eutectoid graphite precipitation causes a "hump" in the castings curve, but from 1200 degrees Fahr. down, the two lines are parallel and close together. The rates of cooling vary under different conditions. For instance, if sand is used as a packing material, the cooling of the castings will be slower.

The electric furnace would seem to be an ideal medium for melting malleable iron. The high temperatures available will give sufficient fluidity to pour the thinnest castings with low carbon metal. The temperature of the metal in the furnace is sufficient to cause carbon absorption, so that a weighed quantity of coke or broken electrodes can be thrown into the metal, and the exact carbon increase figured. If necessary, the metal can be held in the furnace and a quick analysis made before tapping, as in open-hearth steel practice. However, the author has had considerable experience in melting malleable iron in electric arc furnaces and believes that they are not practicable, except in special cases, because of annealing difficulties. It should be noted that electric arc furnaces are mentioned, as the writer has had no experience with malleable iron in induction furnaces. My experience has indicated that electric furnace iron requires a furnace cooling speed of 5 degrees Fahr. per hour or under, to obtain complete annealing. It might be mentioned that with very thin castings, using a slightly oxidizing packing, results, comparable in ductility with normal malleable, may be obtained because of the aid given by partial oxidation of the carbon, which is similar to European practice.

Acid and basic furnaces of different types have been used as well as many variations in analysis without overcoming this slow annealability. Lowering of manganese to correspond to the low silicon of basic furnace practice, or raising the silicon to give a better manganese-silicon ratio had no noticeable effect. Almost every concievable combination of silicon and carbon has been tried, but a free annealing metal has not been produced. Different annealing methods have also been used without a shortening of the annealing time. The work of Honda and Murakami, indicating the graphitization depends on the catalytic action of CO and CO_2 suggests that reducing conditions in the electric furnace may have had some effect on the metal.

High Temperature Held Responsible

Some mill-scale has been added and agitated just before tapping, without any improvements. Exhaustive metallographic tests have thrown no light on the cause of this annealing property, but it is believed that the high temperature of the electric arc, about 6300 degrees Fahr., is responsible. Gray iron undergoes a distinct hardening effect when melted or refined under the electric arc, therefore it is reasonable to believe that this mysterious hardening influence is present in electric furnace malleable and resists graphitization. This hardening effect is permanent for electric furnace malleable heats, producing castings which are not free annealing. It must be realized that malleable cast iron is a sensitive, delicately balanced material, and the fact that cupola malleable has different annealing characteristics than air-furnace malleable, makes it not so surprising that electric furnace malleable differs also.

Although high quality malleable iron can be produced in small quantities, as herein outlined, the average foundryman should think twice before going into this field. Serious complications have developed in most shops where an attempt has been made to load up the gray iron foundry superintendent with brass, steel, or malleable iron. The gating problems of malleable iron are much closer to steel than to gray iron, and the manufacture of malleable is a diversified industry in itself. In making small quantities the costs are high and trouble is liable to be encountered unless an expert is on the job, particularly at the start. Although the electric arc furnace seems ideal for the melting of blackheart malleable, foundrymen should go slow on this medium until more research has been done toward cutting down annealing time.

Will Manufacture Steel Pipe Centrifugally

A license to manufacture hot mold centrifugal cast steel pipe under the Cammen patents has just been issued to a midwestern steel company. This company is not making pipe at the present time but under the terms of the contract will be permitted to manufacture not to exceed 100,000 gross tons of centrifugal steel pipe per year. Provision also is made that should other licenses be issued in the United States, the tonnage of pipe made must not exceed 335,000 tons per year. Providing the licensee has made 90 per cent of its maximum during the year, it shall have the right to make 10 per cent more than the maximum during the next year.

Complete drawings and plans for the process are to be in the hands of the steel company by May 15. Some work already has been started on the machinery. The metal mold is placed in a furnace and heated to 2100 degrees Fahr. From the furnace the mold is placed on a table and transferred to the casting machine, which causes the mold to rotate. By this time the temperature has fallen to approximately 1800 to 1900 degrees Fahr. While the mold is spinning the hot metal is introduced, the mold being rotated for about 1¼ minutes.

At this point the mold is withdrawn from the machine and the casting stripped much the same as an ingot is stripped from its mold. Immediately after being stripped the casting passes through a long muffle furnace, after which it is sent to the soaking furnace for further treatment. The mold is sent back to the heating furnace to be prepared for another casting. One of the advantages claimed for the centrifugal method of casting is the surface smoothness of the finished product.

Quality of Iron Ore Is Uniform

IRON ore shipped to blast furnaces from the Lake Superior district continues to show a remarkable uniformity in average analyses, according to tables compiled by the Lake Superior Iron Ore association, Cleveland. The average amount of iron natural contained in all the ore forwarded from the district in 1922 was 51.87 per cent, compared to 51.37 per cent in 1913. The average quantity of phosphorus was 0.099 per cent in 1922 and 0.09 in 1913; silica, 8.23 per cent compared to 8.03; manganese, 0.76 per cent compared to 0.66 per cent, and average moisture 10.78 per cent in 1922 compared to 11.44.

The average amount of iron natural in ore from the Cuyuna range decreased from 50.09 per cent in 1914 to 46.01 in 1922, while the percentage of manganese increased in the period from 0.27 in 1914, to 3.99 in 1922. Following are comparisons in detail:

Year	Tonnage	Average Iron (Nat.)	Average Phos.	Average Silica	Average Mang.	Average Moisture
GOGEBIC RANGE						
1922	6161 589	52.90	.065	7.89	.80	11.36
1921	2313 846	52.10	.061	9.20	.58	11.72
1920	8098 437	52.75	.066	7.63	.77	11.93
1919	5856 226	52.95	.063	7.74	.63	11.66
1918	7884 525	52.52	.069	7.88	.72	11.90
1917	7481 405	52.75	.068	8.08	.72	11.58
1916	8372 406	53.21	.064	7.60	.64	11.63
1915	5389 749	53.74	.066	7.35	.61	11.18
1914	3518 765	54.00	.061	7.15	.52	11.28
1913	4370 192	53.66	.053	7.74	.51	11.05
MARQUETTE RANGE						
1922	2847 478	51.89	.124	10.50	.37	9.62
1921	1105 791	50.95	.138	11.87	.38	9.38
1920	4208 148	51.70	.122	11.11	.36	9.69
1919	2636 186	51.06	.148	11.87	.37	9.63
1918	4248 869	52.31	.112	10.45	.37	9.42
1917	4570 928	51.56	.132	9.70	.42	10.31
1916	5264 627	51.90	.125	9.89	.41	9.93
1915	3937 937	52.57	.113	10.22	.41	9.81
1914	2393 886	51.60	.102	10.53	.42	9.26
1913	3832 319	51.94	.111	9.82	.40	9.70
MENOMINEE RANGE						
1922	3982 770	50.16	.358	8.76	.56	8.04
1921	1570 289	50.82	.347	8.15	.36	7.79
1920	6460 244	50.20	.332	9.22	.57	7.62
1919	4388 731	50.52	.375	8.23	.57	8.07
1918	6294 806	50.02	.353	9.42	.53	7.99
1917	5866 821	50.16	.324	9.34	.60	7.94
1916	6168 908	50.26	.333	9.43	.59	7.86
1915	4763 611	50.52	.348	8.72	.60	7.81
1914	2953 338	49.61	.319	11.76	.45	7.35
1913	4694 534	49.14	.311	11.19	.53	7.46
VERMILLION RANGE						
1922	1200 008	56.67	.055	9.56	.12	5.73
1921	860 632	58.60	.049	6.53	.12	5.84
1920	940 118	58.62	.057	6.79	.10	5.63
1919	872 061	58.60	.059	6.66	.12	5.85
1918	1157 674	57.90	.057	7.71	.14	5.72
1917	1482 948	58.02	.055	7.55	.14	5.69
1916	1926 332	57.95	.054	7.55	.11	5.87
1915	1704 789	58.02	.051	6.87	.14	6.28
1914	1004 170	58.56	.058	6.38	.13	5.94
1913	1547 832	58.77	.052	6.37	.12	5.78
CUYUNA RANGE						
1922	1481 521	46.01	.218	8.65	3.99	10.75
1921	483 719	49.66	.175	8.90	1.59	11.45
1920	2108 497	46.61	.211	9.05	3.29	11.39
1919	1777 266	48.35	.292	8.60	1.99	11.54
1918	2399 790	43.87	.200	9.85	5.15	11.47
1917	2220 263	48.06	.199	8.92	2.52	10.92
1916	1421 644	48.31	.179	9.07	2.32	11.32
1915	897 782	50.06	.224	9.06	.50	10.75
1914	736 573	50.09	.193	10.02	.27	11.59
MESABI RANGE						
1922	27757 928	51.99	.062	7.92	.67	11.39
1921	16189 712	51.98	.061	7.92	.67	11.49
1920	36122 984	51.84	.063	7.69	.73	11.81
1919	31136 408	51.50	.066	7.75	.75	12.03
1918	39987 207	51.39	.066	7.63	.78	12.04
1917	40899 100	51.25	.065	7.60	.75	12.47
1916	42037 986	50.64	.065	7.61	.78	12.60
1915	29189 620	50.74	.066	7.96	.72	12.39
1914	20827 364	50.81	.067	7.65	.76	12.35
1913	33461 455	50.97	.063	7.50	.76	12.51
GRAND TOTAL						
1922	43431 294	51.87	.099	8.23	.76	10.78
1921	22523 989	52.07	.087	8.23	.62	10.95
1920	57938 428	51.69	.103	8.13	.77	11.09
1919	46666 878	51.57	.108	8.04	.73	11.34
1918	61972 871	51.29	.104	8.12	.87	11.29
1917	62521 465	51.40	.099	8.02	.76	11.57
1916	65191 903	51.20	.097	8.00	.73	11.58
1915	45883 488	51.49	.100	8.14	.64	11.29
1914	31434 096	51.34	.095	8.21	.65	11.30
1913	47906 332	51.37	.090	8.03	.66	11.44

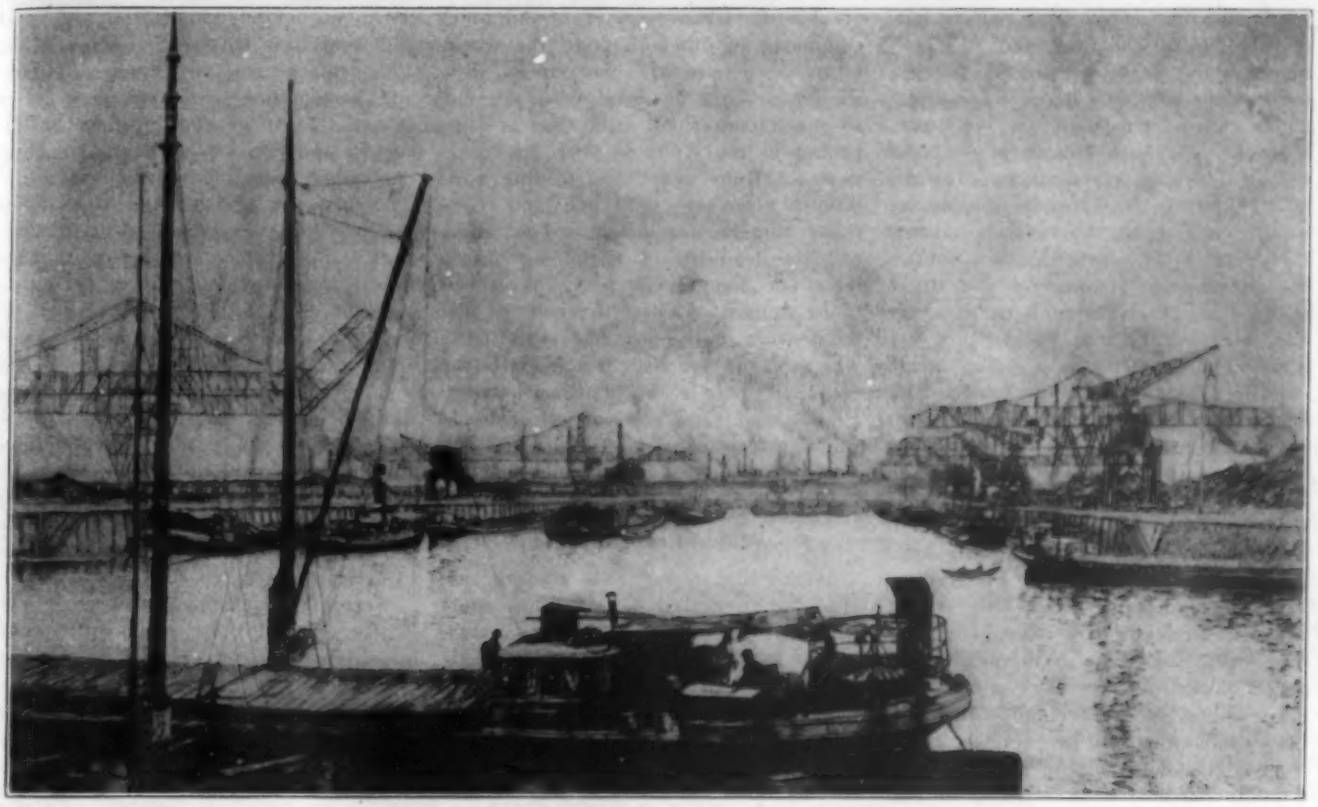
To Develop Safety Code

Formulation of a national safety code for the forging industry is to be undertaken immediately as a result of a conference of 25 organizations held recently in New York. The conference requested that the code include the hazards of drop forging, and other hammer forgings as well as all hazards peculiar to the forging industry and associated with the machines used in the industry. It also requested that the code not include the hazards of cold extrusions of nonferrous metals, or hydraulic presses, except as the sectional committee may find it desirable to include small types of the latter. The inclusion of hot pressing, bulldozing and other forging operations, such as boltheading and rivet-making machines was left to the discretion of the sectional committee. The Safety Code correlating committee has recommended that the code be developed under the joint sponsorship of the National Safety council and the American Drop Forging institute. No action will be taken on the drafting of a code for the sheet and plate metal working industries until that for the forging industry is completed.

Issues Safety Pamphlet

"Handling Material" is the title of pamphlet No. 54 which has just been published by the National Safety council, 168 North Michigan avenue, Chicago. Material handling is recognized as one of the greatest safety problems in industry and according to state reports handling material by hand causes more accidents than all machinery. The pamphlet is divided into the following main divisions: Power trucks, hand trucks, piling material, handling by hand, and safe habits of work. Each of these divisions is arranged in paragraphs dealing with the different types of equipment used and the different methods employed in handling various types of material. A number of illustrations and diagrams are used. A wide range of industries is represented in the discussion.

The Pennsylvania railroad has recently purchased from the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a 20,000-kilovolt ampere turbine generator, complete with condensers, auxiliaries and switching equipment for installation in its Long Island City power house, which supplies power to the Pennsylvania tunnel and terminal electrification at New York. This is the fourth unit of this capacity that the railroad has purchased for this power house.



THE RUHR AT WORK—TYPICAL SCENE NEAR THE CONFLUENCE OF THE RUHR AND RHINE RIVERS SHOWING RHINE BARGE CARRYING IRON ORE UNLOADING CRANES AND STEELWORKS IN BACKGROUND. FROM AN ORIGINAL ETCHING BY A GERMAN ARTIST

Prices Boosted by Ruhr Conflict

Continuance of Occupation Diverts Much Business to America and England—British Producers Dominate Export Situation—Americans Hampered by High Prices—Ferromanganese Shortage Feared by Some

BY H. COLE ESTEP

European Manager, Iron Trade Review

ESSEN'S bloody Easter stiffened German resistance to Franco-Belgian pressure, in the Ruhr and introduced a more warlike tone into the situation. It is clearly evident now that the German people, generally speaking, are acting as a unit and that French efforts to organize the Ruhr in the face of passive resistance are bound to be futile. The industries of the occupied territory will not function normally again until some sort of a settlement of the underlying political controversy is effected. Meanwhile, as a result of the partial stoppage of production in the regions of the Rhine, Ruhr and Moselle, a world-wide shortage of iron and steel products is developing which probably will reach its culmination in May or June. It is likely that by that time the supply of commodities will be more equal to the demand.

This will result from the general working of economic forces. There is not much hope of a satisfactory settlement of the Ruhr conflict at an early date. The wearing down process to which both sides are being subjected will have to go on for some time longer, until the contestants are reduced to a more reasonable frame of mind. The situation early in April was similar to that which prevails toward the middle of a big strike when both sides are outwardly more belligerent than ever but are beginning to count the cost. The latter is running into millions. The direct military expenses of the French army up to date are $12,000,000. The industrial losses of all the parties to the conflict are easily $500,000,000, a large share of which has fallen on the shoulders of the coal and iron producers of France, Germany, Luxemburg and Belgium. But the people at large cannot escape what is beginning to be called the Ruhr tax.

Meanwhile both sides are feverishly organizing "behind the lines" so as to carry on their industries as well as possible while the issue is being fought out. In this task of adapting production and commerce to unforeseen conditions Germany appears to be showing the greater activity; on the other hand France is making slow headway in the Ruhr itself. In spite of any reorganization which is being effected. European industry is learning at tremendous expense that no immediate substitutes are possible for Ruhr coal and pig iron. The attempt to find substitutes is bringing large volumes of business to the iron, steel and coal producers of the United States and Great Britain, who are realizing satisfactory profits for the time being.

It is hoped this windfall will not blind business men in the western world to the tremendous economic cost of the Ruhr disturbance, since the beginning of the year the rate of coal

production in western Europe has fallen off 500,000,000 tons and pig iron output about 1,000,000 tons per month, to mention only two items. These declines can be measured only in terms of loss. They are factors in the cost of the present disturbance. Instead of trying to increase production, amass wealth, and repair the ravages of war, this year finds Europe again indulging in an orgy of waste and destruction. Property is being frittered away and great productive instruments are idle. The loss is on a lesser scale than in the late war, but the tax is a heavy one to an already impoverished continent. Signs are beginning to appear showing how the waste in the Ruhr is undermining the soundness of the European business structure. In a small way French and Belgian competition is reappearing in world markets for iron and steel. This is not because production in these countries has been restored to anything like normal volume, but is the consequence of a falling off in demand from local consumers who can no longer afford to pay the advanced prices resulting from the sudden contraction in output.

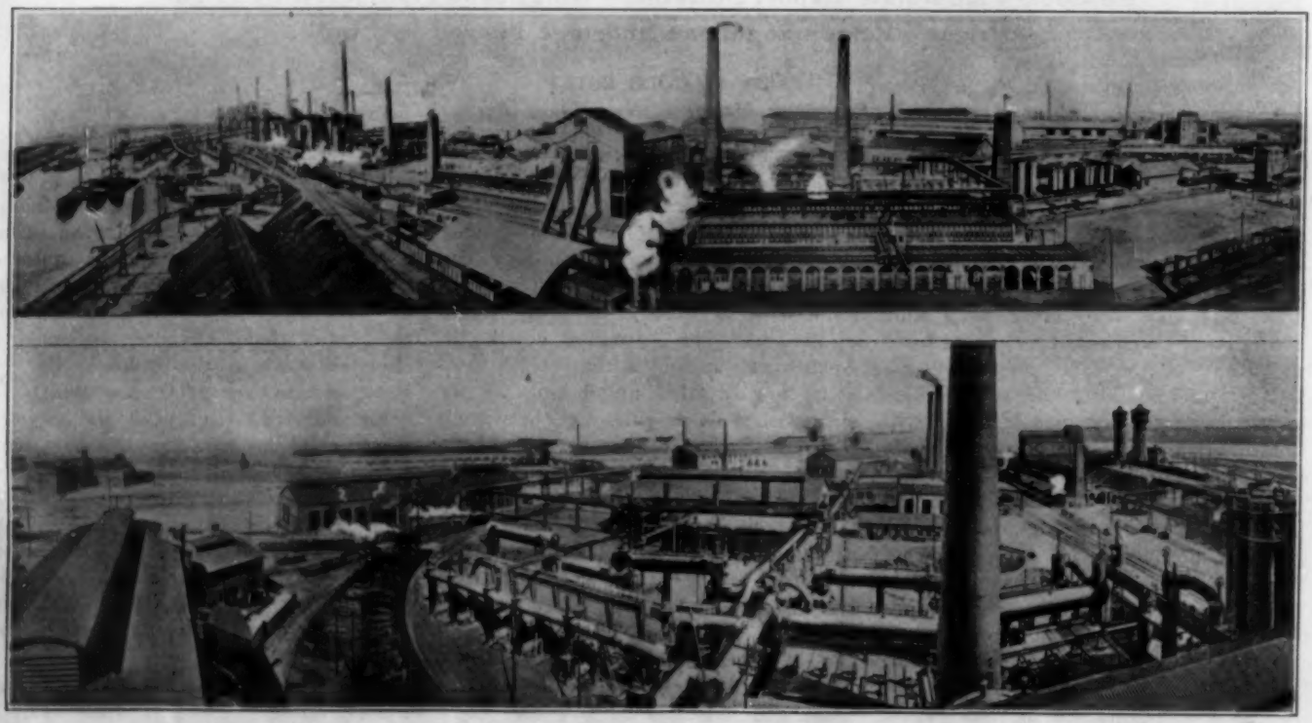
In other parts of the world there are many consumers who are still producing and can afford to pay the ruling prices. Market conditions therefore remain stimulated. The apex of the present movement, which is world-wide, has not yet been reached. As the fourth month in the occupation of the Ruhr draws to an end, the effect of this disturbance on iron and steel commerce in other parts of the world becomes increasingly pronounced. For the time being, business men are not so much concerned with what is happening in the Ruhr as with the reactions of Ruhr events on trading conditions elsewhere. France and Germany remain deadlocked. The affect of this deadlock is advancing prices which do not appear to have reached their summit, although much of the momentum in the rise has been spent. The next big event to watch for is the commencement of negotiations between France and Germany—or alternatively the outbreak of a military war. The latter occurence is improbable but not impossible.

Why Prices Advance

Meanwhile thoughtful traders are studying underlying conditions more carefully than ever. Markets everywhere are under the influence of abnormal factors. Sudden changes are likely. The transformation of Germany from a producer to a consumer of iron, steel and coal has introduced forces which are not yet fully evident. In the United States the connection between cause and effect is somewhat obscured by local conditions, but there can no longer be any doubt that American iron and steel markets are responding directly to recent events in Europe. The situation can easily be analyzed.

Germany and Germany's customers have become buyers of iron and steel and coal and coke on a large scale. The same is true of France, Belgium and Luxemburg to a somewhat lesser extent. Most of the business so diverted and created is going to England where prices have advanced heavily since the first of the year. For the first time in several years American manufacturers are being relieved of European competition; English sales of coal and pig iron to the United States have ceased. At the same time the demand for American fuel and American steel products from abroad has increased. This decrease in foreign competition and increase in foreign demand is a compound factor which, impinging on an already strong domestic situation, has accelerated the upward movement of the American market.

Ferromanganese has been more violently affected than many other commodities, because of the paucity of American domestic manganese resources. With the important German production eliminated for the time being, and consumption of this essential steelmaking alloy growing rapidly both in America and England, some observers foresee a world shortage which will result in a price in the United States of at least $150 a ton. Whether these fears are justified or not, a stringency has developed which can be traced directly to the disturbance in the Ruhr. The export price in Great Britain has already advanced



THE FRIEDRICH ALFRED HUTTE AT RHEINHAUSEN OPPOSITE DUISBURG, OWNED BY FRIED. KRUPP A. G., ESSEN—GERMANY'S LARGEST BLAST FURNACE PLANT, HAVING 12 STACKS. UPPER—A VIEW SHOWING COKE OVEN PLANT WITH BLAST FURNACES AT THE LEFT. LOWER—A VIEW FROM FURNACE NO. 1, TOWARD THE STEELWORKS AND ROLLING MILLS

from £14 to £19 a gross ton f.o.b. ship, that is from $65 to $90, with supplies difficult to obtain at the latter figure. In the same period the American market for the domestic alloy has jumped from $102.50 to $125.

The important place occupied by Germany in the ferroalloy field is shown in the following table in which the production of ferromanganese of the three principal countries for the past three years is given:

(Gross tons—000 omitted)

	1922	1921	1920
United States	150	104	295
Great Britain	197	36	183
*Germany	150	100	90
Total	497	240	568

*Estimated.

Germany ordinarily produces around a third of the world's supply of ferromanganese and exports a considerable portion of its output. In December Germany's exports were 4286 tons and in January 4411 tons. Great Britain is the leading producer at present. The United States is a consistent importer of this metal, depending for its requirements on both Great Britain and Germany. Now, with a rising demand, American steelmakers are obliged to depend entirely on British sources.

Imports Are on Increase

Imports of ferromanganese into the United States last year were approximately 98,000 tons, estimating from returns covering the first 11 months. The American consumption in 1922 was about 250,000 tons. Production in domestic furnaces was 150,115 tons. This year it is estimated that the requirements will aggregate 450,000 tons, and that the production may reach 300,000 tons, leaving at least 150,000 tons to be imported. These figures contemplate imports at an average rate of 12,500 tons per month. Actually in January 12,529 tons and in February 9361 tons of British alloy was shipped. In the past few years British exports of ferromanganese to all countries have been as follows:

	Gross tons
1922	142,704
1921	32,472
1920	117,334
1913	178,919

So far this year the total British exports to all destinations have averaged only 15,000 tons per month, and the production about 20,000 tons per month, compared with a monthly output of 16,400 tons in 1922. The important feature of the situation is that up to date the United States has been getting ferromanganese from England at the rate of only 120,000 tons a year; it produced in the first quarter at the rate 240,000 tons; it is likely to need at least 150,000 tons of foreign metal, and as far as can be foreseen British furnaces are the only source of supply.

British producers are few in number —less than a dozen—which enables them to maintain a strong grip on the market, and they are now being called on to sell their product in quarters hitherto dominated by Germany. The British furnaces are sold out until the of fourth quarter and a considerable tonnage has been allocated up to the end of the year. The only free metal available for prompt shipment in the United Kingdom is in the hands of merchants who are holding for prices ranging from £19 to £20 ($90 to $94.70) a gross ton f.o.b., with expectations in some quarters that up to £25 ($117.50) may be realized.

Sweden is the only other important European producer of ferromanganese for export, but its capacity including the electric furnace output does not exceed 25,000 tons a year, or say 2000 tons per month, practically all of which has already been sold to German consumers in unoccupied territory.

The American domestic capacity is strictly limited by the manganese ore supply, which is unsatisfactory owing to inability to obtain full supplies from Russia. This is not a new situation but it has become acute since the increased demand sprang up this year. Imports of manganese ore last year into the United States were 374,451 gross tons. Of this quantity the Steel corporation mined 205,677 tons from its properties in Brazil. In British markets, Indian ore is now firmly maintained at 1s 9½d per unit, with Caucasian 1s 7½d, equivalent to 41 cents and 38 cents respectively. Offers of 37 cents for the latter ore by American interests have brought out only small tonnages. Considerable stocks of manganese ore are tied up in Germany.

Ferromanganese is by no means the only commodity affected by the Ruhr situation. All other iron and steel products have been disturbed although not quite so seriously. Wire rods have been especially sensitive because of the requirements of German wire-drawing plants outside the occupied territory which have been compelled to turn to foreign countries for supplies. Recently German interests offered £14 a metric ton, Hamburg for wire rods without finding takers. British merchants quoted £13 10s f.o.b. These figures are equivalent to $66 and $63.50, respectively. Wire products have been similarly affected, so that Belgian mills with a small tonnage to sell have been able to get 1350 francs a ton, equivalent to 4.30c per pound. Canada has sold Europe nails recently at 3.25c, f.o.b. Monteral, and galvanized barb wire to Germany at 4.50c, f.o.b. Early in April Germany entered the market and bought large tonnages of American steel including electrical sheets and other less highly finished materials.

How Prices Have Advanced

The accompanying table shows how prices have advanced since the first of the year in the United States, France and Great Britain. German prices are not given because they are largely nominal. Before the occupation of the Ruhr, France's prices generally speaking, were lower than those of its western competitors. Today they are higher than the figures prevailing in either the United States or Great Britain. French pig iron is now $36 to $39, furnace, compared with $33 in America and $30 in England. Bars, plates and shapes are now 2.65c to 3.00c, compared with 2.45c to 2.55c in the United States and 2.25c to 2.30c in Great Britain. These figures reflect the difficulties of the French producers and the cost of the Ruhr operation to France.

The French iron and steel industry now believes that the worst is over as far as restricted production is concerned, although there is little im-

World Prices Compared

Reduced to Dollars at Current Exchange, Showing Advances During First Quarter

	Jan. 1, 1923			April 1, 1923		
	U.S.A.	Great Britain	France	U.S.A.	Great Britain	France
Ferromanganese	$102.50	$65.10	$65.50	$125.00	$89.50	$74.35
Bessemer (hematite) pig iron	29.00	21.75	21.40	33.00	30.50	39.00
No. 2 foundry pig iron	29.00	21.40	16.40	33.00	30.00	36.00
Billets	37.50	32.55	25.40	45.00	45.00	50.00
Wire rods	46.00	45.34	35.00	49.00	61.00	63.00
Bars	2.00	1.70	1.40	2.45	2.30	2.75
Plates	1.90	1.65	1.95	2.55	2.25	2.65
Shapes	2.00	1.60	1.45	2.55	2.25	3.00
No. 28 black sheets	3.40	2.30	3.10	3.75	2.75	3.50
No. 28 galvanized sheets	4.40	3.65	4.00	5.00	4.15	4.90
Tin plate	4.75	4.75	...	5.25	5.50	...

Ferromanganese, pig iron, billets and wire rods quoted in dollars per gross ton; bars, plates, shapes and sheets in cents per pound; tin plate in dollars per base box. American prices quoted Pittsburgh base; British and French, f.o.b. for export, except French April prices are f.o.b. furnace or works, there being virtually nothing offered for export.

mediate prospects of lower prices. Out of 152 blast-furnace stacks in the East and Alsace-Lorraine districts not over 40 are in operation. Many of Luxemburg's 47 furnaces are out. But to a certain extent France and Luxemburg are reorganizing their fuel supplies, which gives rise to the hope that the crisis is passing. About 1060 tons of blast furnace coke a day is being received from the Ruhr. This is only a small fraction of the average of 12,500 tons a day which was received prior to the occupation. Efforts recently have been made to increase shipments from Germany by organizing labor gangs for the purpose of loading coke in the Ruhr. Relatively little progress has been made and responsible elements in France do not look for large shipments from Germany until a political settlement is effected. Meanwhile Belgium is shipping about 1000 tons daily, England about 3000 tons daily, Holland 400 tons, and Czecho-Slovakia 600 tons.

Coke Insufficient

The total of 6000 tons of coke a day is less than half the normal receipts from Germany alone. The French coke ovens are furnishing about 140,000 tons per month, so that the total available supplies are now about 320,000 tons per month, sufficient if it were all used for smelting ore for not more than 275,000 to 300,000 tons of pig iron per month, depending upon the economy of the furnaces. In December France produced 506,000 tons and in January 478,600 tons of pig iron.

The shipments of fuel from the United States have not been included in the foregoing figures since they constitute only a few cargoes which will be immediately absorbed in the general demand. But the dramatic factors of the Ruhr occupation certainly are emphasized when one considers that the French pig iron producers are bringing coke 4000 miles over land and sea from Pittsburgh to meet the urgent needs of the moment while at the same time unlimited quantities are available in the Ruhr less than 150 miles from most of the French furnaces. The French purchases of coke in America also offer conclusive proof of the success of the German program of passive resistance insofar as that program is intended to hamper French manufacturing operations.

Turning again to the comparative prices shown in the accompanying table, it will be noted that British quotations in almost every case are lower than those coming either from French or American producers. Before the occupation of the Ruhr, Great Britain was in a strong position with reference to export trade in iron and steel products. Today it is in a dominating position. Until recently the British mills also have been favored by being able to give earlier deliveries than most American producers. The English plants are now becoming congested, so that this advantage is disappearing. The price differential in favor of British steel is about $5 a ton. Not long ago British 3 x 3 inch angles were offered at £11 7s 6d, c.i.f. New York, equivalent to 2.39c. Delivery was promised in six weeks. Prior to Jan. 1, British mills were turning out about 600,000 tons of crude steel per month. This represented about 65 per cent of maximum capacity. In other words, when the demand for heavy tonnages commenced as a result of the occupation of the Ruhr, British producers were in a much less satisfactory position than those in the United States and were anxious to quote favorable prices to obtain business. British mills are not yet producing at full capacity. The position at the beginning of April was that all of the prewar plant and about 65 per cent of the additional capacity built during the war was engaged, leaving an unabsorbed capacity of approximately 200,000 tons a month, a portion of which of course represents plants which cannot be operated except at high cost.

It is clearly evident that under present market conditions American producers can obtain foreign business only because buyers are unable to fill their requirements in other countries. On the basis of price alone the American mills are in a strong position only on wire products, pipe, and one or two other commodities.

The United States and Great Britain are not the only countries which have enjoyed an improved demand as a result of the occupation of the Ruhr. Business has also been stimulated in central Europe, particularly Austria and Czecho-Slovakia. Western producers however need not fear much competition from these sources because the production in this part of the world is limited and most of the capacity has now been absorbed. A number of blast furnace stacks have recently been relighted in Austria and Czecho-Slovakia and the mills in this territory are now full for the next two or three months. The prices quoted are high, bars having been sold to Germany recently at 2.77c to 3.19c per pound, f.o.b. mill. But on account of the close proximity of the mills to the German border the delivered price to Germany is less than that obtainable from either Great Britain or the United States. Austrian and Czecho-Slovakian producers are quoting in sterling and Germany is paying for her purchases in the same currency, largely through London banks.

How Long Will It Last?

How long are the conditions brought about by the occupation of the Ruhr going to last? This is the most important question brought out by the foregoing survey of the market situation. The answer depends upon political factors which cannot be foreseen. At the present time there are few indications of an early settlement. On the whole German resistance is unweakened and the temper of the population is exceedingly hostile. Various efforts have been made to divide the German people against themselves along class lines and also sectionally, without success.

On the other hand, industrial conditions are growing more and more unsatisfactory in Germany. Unemployment is undoubtedly increasing, particularly in the occupied territory where production in many lines has reached an unprecedentedly low ebb. Better conditions are observed outside of the occupied territory where many plants have profited from the trouble in the Ruhr. German exports of iron and steel which were 263,035 metric tons in December fell off to 214,450 tons in January, the latter figure being the lowest since August. The figures for January naturally do not reflect the effect of the occupation to any extent.

Traffic in the Ruhr is almost at a standstill and practically no progress has been made towards reorganizing the Ruhr railways on any effective industrial basis. There is virtually no contact between the Ruhr and the rest of Germany for the interchange of commodities. This has affected the blast furnaces in the Ruhr basin seriously because their limestone supplies are drawn from quarries situated south of the Ruhr river in unoccupied territory. Although these quarries are only a few miles away, the French customs cordon lies between. German railroads are unwilling to ship in limestone because the cars are not returned from occupied territory. If the limestone problem could be solved pig iron production could be resumed in the Ruhr on a much more extensive basis.

Meanwhile the French authorities have announced they will not evacuate Essen until reparations are completely paid. Just what this means no one knows but it is another of the many political factors which at present tend to prolong the disturbance

Use Powdered Coal for Malleable

Application of Pulverized Fuel to Air Furnaces for Melting Points Way to Further Advancement—Use for Annealing Already Established—Equipment for Crushing and Handling Coal Is Described—Operating Data Given

BY E. E. GRIEST

DURING the past three years the use of pulverized coal for all malleable foundry operations has been given much thought by combustion, foundry and metallurgical engineers. This together with the interested and intelligent co-operation of foundry executives, has changed the status of pulverized coal from the experimental to the practical operating stage. There are now at least 10 foundries using pulverized coal for melting and from the interest expressed many more are giving the subject serious consideration.

Just why pulverized coal has not been used in air furnaces when it has been used so successfully for annealing, is difficult to explain. There was, apparently, a prejudice against the use of any kind of fuel except lump coal. Conservatism probably explains this attitude. When good malleable is being produced at a reasonable cost, radical changes in methods are not looked upon with favor. In reality pulverized coal methods for firing a melting furnace are not so radically different from hand firing methods as first thought would indicate. If the same quality of coal is used the only difference between the two methods is the preparation, which in this instance means the size of coal used. Sufficient air to support combustion is necessary in both methods.

The Chicago Railway Equipment Co. owns two malleable foundries, one at Marion, Ind., and the other at Grand Rapids, Mich. Prior to installation of pulverized coal equipment the best quality of lump coal from the Eastern Kentucky or West Virginia fields was considered the most economical coal to use for melting furnace operation. While coal from other fields was used from time to time, Kentucky coal was considered best.

Contemplated Saving in Coal

As both foundries are located close to the Indiana coal fields, it was thought that a saving of no small amount could be expected if Indiana coal could be used successfully for melting. If coal of any preparation could be used, the source of supply could be so arranged as to insure continuous operation under almost any condition. Figures submitted indicated that the investment, while of no small amount, would be justified by the savings contemplated. While the general arrangement of foundry buildings is very different at the two plants, the general arrangement of the pulverized coal systems is much the same. The pulverized coal buildings and equipment therein are practically alike at both plants. In describing the plants, one description will answer for both except when especially noted otherwise.

Storing and Handling Coal

It has been the practice of the company for many years to keep a fair amount of coal in storage. The pulverized coal buildings were located so as to be as near the coal storage space as conditions permitted. At Marion, the building is located about central of space in which about 3000 tons of coal can be stored. At Grand Rapids, where more ground space is available, the building is about central of a space in which about 6000 tons of coal can be stored and about half of this can be transferred from storage to the track hopper by the swinging of the boom of the locomotive crane. Fig. 1 shows the pulverized coal plant, with pulverized coal distributing lines running to furnaces and annealing ovens.

An ideal arrangement for handling coal in such a plant would be to have all coal delivered in hopper bottom cars with such regularity that the supply would be plentiful, yet no coal would have to be stored. With a plant in close proximity to coal mines, the storage for crushed and pulverized coal could be so arranged as to avoid any manual coal handling cost. The next best arrangement is to arrange the plant so that storage coal can be handled into the track hopper with a minimum expense. Our track hopper has a capacity of 50 to 60 tons; the crushed coal storage bin 60 tons and the two pulverized coal bins 50 tons. On the basis of operating at capacity, our plants have storage space for crushed and pulverized coal for three days operation.

From the track hopper, coal of any preparation feeds by gravity through a reciprocating feeder into a coal crusher. The lumps are crushed so that the coal leaves the crusher in about the size that would pass through a 1¼-inch screen. From the crusher the coal drops into a bucket conveyor, which conveys it to a 60-ton bunker located near the top of the building. During this time much of the free moisture drains from the coal. The bunker can be of any size. It should be sufficiently large to store an amount of coal that will keep the plant in operation should any trouble occur with the crusher or conveyor. It is advisable to keep the bunker well filled.

From the bunker coal feeds onto a belt which conveys the coal under a magnetic separator, for the removal of spikes, picks, etc., into an automatic weighing scale. From this scale the coal drops into a screw conveyor which takes it into one end of a cylindrical dryer. As the dryer revolves slowly, hot gases from a hand-fired combustion chamber pass through the moving coal and remove most of the combined moisture as well as the free moisture. When the coal reaches the lower end of the dryer it falls into another screw conveyor which delivers the coal to a bin located adjacent to a pulverizer. From this bin the coal is fed automatically, but under control of the attendant, into a pulverizer of the air separator type. As the coal is crushed to the desired fineness, it is lifted by a suction fan into a collector, the air returning to the pulverizer to be used again and the coal dropping into one of two 25-ton pulverized coal bins. These bins located in the pulverized coal building are the only ones in which pulverized coal is stored.

Controlling Air and Coal Mixtures

From the storage bins the coal is fed by screw conveyors into the suction side of a blower fan. At this point in the system an automatic float valve is installed that changes its position as valves at furnaces or ovens are opened or closed. The arrangement is such that a constant mixture of coal and air can be maintained. The size of distributing pipes are so calculated that the coal remains in suspension in the air even when no coal is being used. This proportion is usually maintained at from 35 to 50 cubic feet of air per pound of coal. In this proportion the mixture is not explosive, but requires the addition of at least 100 cubic feet of air for combustion, which is injected into the mixture at the fur-

From a paper presented at the Rochester, N. Y., convention of the American Foundrymen's association, June 5-9, 1922. The author is general superintendent, Chicago Railway Equipment Co., Chicago.

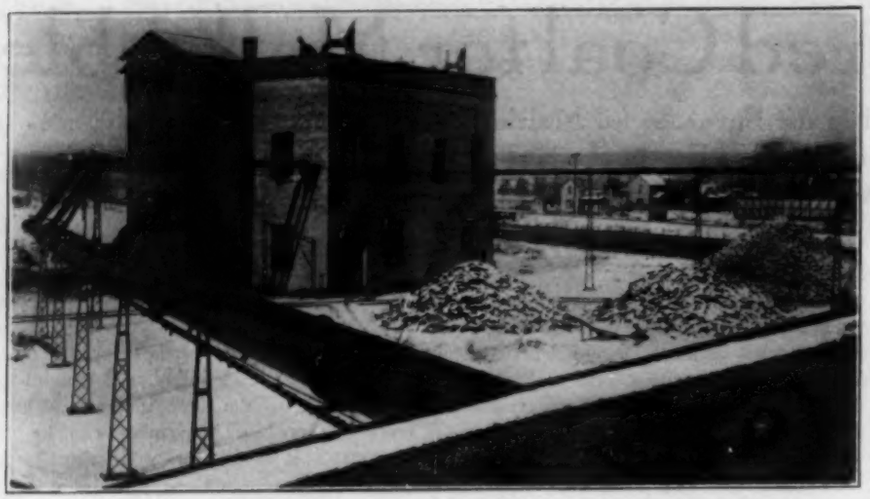


FIG. 1—VIEW OF THE PULVERIZED COAL BUILDING AT GRAND RAPIDS, MICH., PLANT OF CHICAGO RAILWAY EQUIPMENT CO. SHOWING DISTRIBUTING AND RETURNING LINES

nace, and which is supplied by a motor or turbine driven fan located near the melting furnace.

As a valve in the coal line at a furnace is opened, an increased amount of air enters the distributing system instantly and thus the pressure in the distributing lines is maintained constant. At the same time by a synchronous control a variable speed motor connected to the feed screws from the pulverized coal storage bins is speeded up sufficiently to feed an increased amount of coal into the line so that the proportion above referred to is maintained. The proportion of coal and air can be easily adjusted, but when set, automatically maintains the correct proportion. From this description it might be thought that the arrangement is complicated but as a matter of fact the apparatus is simple, has few parts and has given no trouble.

When in operation, the distributing line is always full of the mixture of coal and air and remains filled at all times regardless of the number of furnaces operating. The distributing line is returned to the pulverized coal building where the coal that is not used at the furnaces is separated from the air by means of a collector, the coal returning to the storage bin and the air to the distributing line. After all furnaces have been shut off, the blowers are operated for a short time without feeding additional coal into the line and in this way all pulverized coal is returned to the storage bins in the pulverized coal building, thus there is no storage of pulverized coal near the ovens or furnaces or in the foundry buildings, and all motors and machinery are in one building.

Standardization of Equipment

The pulverizing of coal and the handling of the coal incident thereto has been practiced for so many years that standard practices have been established. There are numerous companies manufacturing equipment of this kind and the equipment has been developed to a high state of efficiency. To one unfamiliar with the practice there appears to be a great deal of machinery. But blowers, conveyors, crushers and pulverizers give little trouble even when given mediocre attention. The balls or rollers and races of pulverizers must be renewed occasionally, but provision has been made for the quick renewal of such parts, so that little delay results when these parts require renewal.

When distributing lines are long, booster sets may be installed in order to maintain sufficient velocity of the mixture. These booster sets are merely motor driven fans which may operate continuously with no more attention than any other motor or fan. In recent installations the boosters have been eliminated. Where the lines are of sufficient length as to require boosters, substations are provided. The coal is delivered by a high pressure air ejector delivery system to the substation, and the coal is delivered to the furnaces through a relatively small distributing system. Where some furnaces are isolated, this system could be operated for somewhat less expense than could a system which requires boosters.

The arrangement of the melting furnaces at the Marion foundry is shown in Fig. 2. When the melting furnaces in the new foundry are being operated, it is necessary to operate the booster blowers which are located as indicated. When melting furnaces Nos. 2 and 3 only are being operated, a crossover connection is made at the point indicated and in this way the length of distributing line is greatly shortened and, of course, the booster is not required. A crossover installed in the annealing system permits the operation of six annealing ovens and eliminates the necessity for the booster.

Power Consumption Calculated

The power consumption of the motors used for preparing and distributing pulverized coal was obtained with the aid of a graphic wattmeter, which was placed in the circuit of the motor under test and a check was made with an integrating watthour meter placed in the motor cricuit at the same time. Tests were conducted for a sufficient length of time to record actual operating conditions.

From these data a summary is given below showing power consumed to prepare 2000 pounds of eastern Kentucky coal of nut, pea and slack preparation of the following analysis:

	Per cent
Moisture	2.53
Volatile	31.56
Fixed carbon	53.79
Ash	12.12

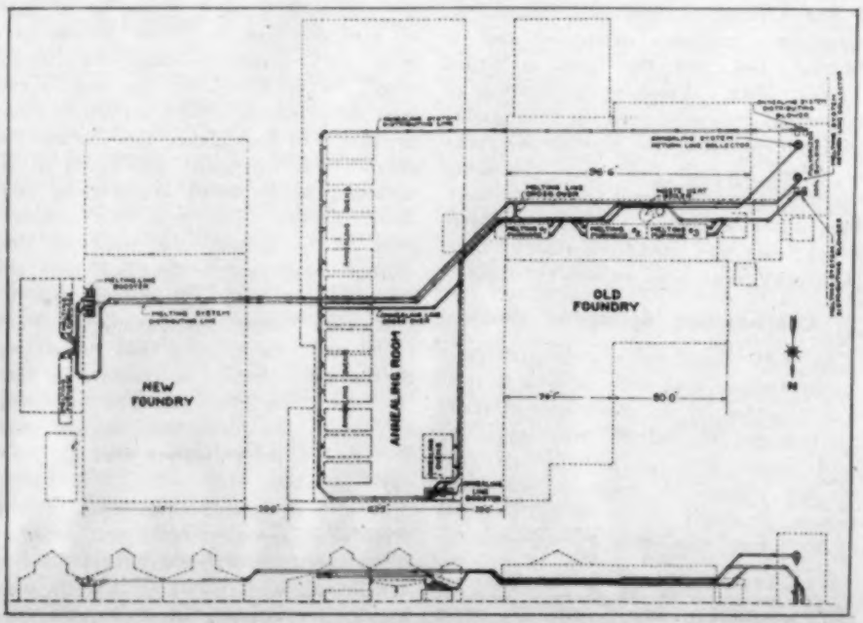


FIG. 2—ARRANGEMENT OF THE MELTING AND ANNEALING EQUIPMENT IN THE MARION PLANT SHOWING THE PULVERIZED COAL LINES

Sulphur	0.55
B.t.u. as received	12,373
B.t.u. dry	12,694
B.t.u. combustible	14,694

Power Consumed Per 2000 Pounds of Coal

Operation	Horsepower of motor	Kilowatt-hours per ton of coal
Reciprocating feeder	5.0	0.073
Crusher	15.0	0.212
Bucket conveyor to storage bin	10.0	0.191
Belt and screw conveyors—storage bin to dryer	5.0	1.150
Magnet	—	0.475
Dryer	7.5	1.008
Screw conveyor—dryer to pulverizer bin	3.0	0.619
Pulverizer—1¼ ton	25.0	17.800
Exhauster fan—pulverizer to storage	7.5	2.112
Total		23.064

From these figures it would appear that some of the motors are quite large for the load carried, but it should be considered that the starting load is quite high. Most of the machinery is heavy and slow moving. The instantaneous starting load is high, but after it is started the power required to keep it moving is relatively low. With a 5-ton per hour capacity pulverizer, the power consumption per ton of coal is greatly decreased and tests conducted show that 1 ton of eastern Kentucky coal is pulverized with a current consumption of 13.20 kilowatt-hours.

Power required to distribute one ton of coal in the melting furnace line:

Operation	Horsepower of motor	Kilowatt-hours per ton of coal
Feed screws	3.0	2.11
Distributing blower	40.0	27.1
Total		29.21

Power required to distribute one ton of coal in the annealing oven line:

Operation	Horsepower of motor	Kilowatt-hours per ton of coal
Feed screw	3.0	2.11
Distributing blower	40.0	30.00
Total		32.11

If the lines are of sufficient length to require boosters, the power consumption will be increased by an amount approximating the power required to drive the distributing blowers.

Secondary air is required for both melting furnaces and annealing ovens in amounts varying with the number of furnaces or ovens being fired at one time. The secondary air used in hand fired furnace practice is sufficient, generally for pulverized coal operation. For annealing ovens the secondary air is supplied by a motor driven fan. The power required to supply this air for varying numbers of ovens of 35 tons capacity is as follows: For two, the average load is 3.6 kilowatts; for three ovens fired at one time it is 4.0 kilowatts; for four ovens it is 4.5 kilowatts; and for five, the load is 5.0 kilowatts.

FIG. 4—TWO 25-TON MELTING FURNACES WITH A WASTE HEAT BOILER IN THE BACKGROUND. THE BOILER CAN BE FIRED WITH WASTE HEAT GASES FROM ONE OR BOTH MELTING FURNACES OR WITH PULVERIZED COAL DIRECT. IT IS ALSO ARRANGED FOR HAND FIRING

Summary of Power Consumed

One ton eastern Kentucky coal prepared and distributed to melting furnaces and annealing ovens requires expenditure of electrical energy as follows:

Melting furnace	Kilowatt-hours
Crush-pulverize, etc. (1¼-ton pulverizer)	23.64
Feed screws	2.11
Distribution (no booster)	27.10
	52.85
If booster required add	26.49
Total	79.34
If pulverized in 5-ton pulverizer subtract	4.60
	74.74

Annealing ovens	Kilowatt-hours
Crush-pulverizer, etc. (1¼-ton pulverizer)	23.64
Feed screws	2.11
Distribution (no booster)	30.00
Secondary air	4.50
	60.25
If booster required, add	30.00
Total	90.25
If coal pulverized in 5-ton pulverizer, subtract	4.60
	85.65

Knowing the cost for current, the power cost is easily figured. These figures cover power only and are outlined in this detail, as authentic figures of this kind were not available at the time our plants were purchased. The power figures given above were obtained under extremely unfavorable operating conditions, that is, the plant was operating at about 20 per cent capacity. Under normal operating condition with large heats and large tonnages being annealed, the power costs would, of course, be different from these outlined. With a system such as ours, we have a maximum of flexibility, but the maximum efficiency, of course, is not obtained under minimum production conditions. Unfortunately, our foundries have not operated under normal production conditions since the installation of the pulverized coal plants. As soon as conditions permit, a further test will be made to determine the power consumption under normal operation conditions. The figures given above while somewhat misleading, should not be considered as being applicable under favorable operating conditions. The figures for pulverizing, elevating, crushing and delivering the pulverized coal to the storage bins may be considered as representative, regardless of the production in the plant.

Coal Suitable for Burning

It would seem from tests conducted that almost any kind and quality of coal can be burned successfully. Some coals cannot be burned in this form economically, although it might be possible to mix certain inferior coals with good quality coal and get fair results. The ideal coal to use would be low in ash and moisture and high in volatile and heat units. Many coals from the eastern Kentucky and West Virginia fields meet these specifications.

As pulverized coal is ground into small particles it would seem that coal purchased as slack would be the most economical. The statement has been made frequently that slack preparation,

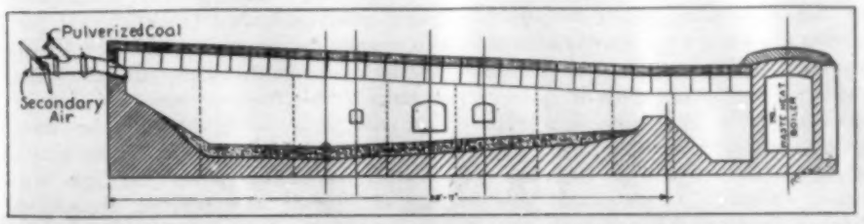


FIG. 3—SKETCH WHICH SHOWS THE GENERAL CONTOUR OF A MELTING FURNACE

or nut pea and slack, as is commonly produced in the Kentucky and West Virginia field, requires no preliminary crushing. It is true that such coal can be fed directly into pulverizers, but more power is required to pulverize large lumps of coal than is required to pulverize small lumps. The coal should be run through a crusher to break up the larger pieces as these large pieces reduce the capacity of the pulverizer and materially increases the cost. As has been previously noted the power required for crushing is comparatively little. Unless the slack is entirely free from lumps no larger than a 1-inch cube, it should be run through a crusher. It is less costly to crush coal in a crusher than in a pulverizer.

Coal as received should be analyzed occasionally to check the shippers' methods of mining and preparation. This is particularly advisable if mine run or slack is used since all cuttings from roof and floor are finally deposited in the finest preparations. From the same mine, lump coal may show an ash content of 3 per cent, mine-run 6 per cent and slack 10 to 12 per cent and the heat units of corresponding variations. For this reason lump coal is worth more than mine-run coal and the latter is worth more than slack, all, of course, from the same mine. The cost of crushing almost can be ignored. Some trouble may be experienced with large lumps clogging the crusher. The resultant coal from a 4-inch screen makes a fine preparation.

From the data gathered covering cost of pulverizing, etc., together with a study of the results obtained from various kinds of coal and considering also the analysis of the coal the price that any coal is worth can readily be calculated. Do not expect to get the same coal to iron ratio from slack of mine-run preparation as you would obtain from lump coal from the same mine. The ratio will decrease in about the same relative proportion as does the heat unit content or as the ash content increases.

Coal Costs Are Analyzed

Analysis of some coals burned successfully in melting and annealing furnaces are shown in Table I. While all of these coals were burned successfully, yet there was a large difference in the cost per ton of iron melted or annealed. Kentucky No. 2 gave the best iron to coal ratio, but it was not worth the high price wanted for it. Kentucky No. 3, considering price and performance was the most economical.

Some tests were made with anthracite culm as a matter of information. When it was first tried in a melting furnace much trouble was experienced in getting a flame. The coal was of poor quality as is indicated by the analysis below:

	Per cent
Moisture	4.94
Volatile	8.91
Fixed carbon	61.23
Ash	24.92
B.t.u. per pound as received	10,289
B.t.u. per pound dry	10,814
B.t.u. per pound combustible	14,699

The trial, when it was burned in the same manner as bituminous coal, was a failure. It was mixed with bituminous coal and little better results were obtained. Finally the furnace was heated with bituminous coal and then anthracite was turned in and it was found that heats could be taken off in this manner. Almost any bituminous coal, sufficiently low in sulphur, would be more economical than this quality of anthracite at the same cost per ton. Although only a small quantity of this coal was used it was found to be more expensive to pulverize and much more destructive on the equipment due to its abrasive constituents.

Moisture in Coal Objectionable

Some authorities contend that moisture up to 8 or 10 per cent is not particularly objectionable and that it is unnecessary to dry coal containing this amount of moisture or less. Some companies have considered installing pulverizing equipment without dryers in order to keep down the cost of the plant. If a plant was assured of a supply of coal of a low-moisture content such as is represented by Kentucky No. 2 or No. 6, there would be some reason to consider a plant without a dryer. If Indiana, Illinois or any of the western coals are used even occasionally a dryer is necessary for economical operation. Our experience has been that coal should be dried so as to contain not more than 1½ per cent moisture preferably less than 1 per cent, if best fuel economy is to be obtained from melting furnaces.

While it is feasible to burn coal with 10 per cent moisture it is certainly not economical to melt iron with such coal. In ordinary heating furnaces, in boiler combustion chambers and in annealing ovens, the moisture content does not seem to be so important, but for quick heats, a minimum of oxidation and a high coal ratio in melting furnaces, dry coal is essential. For plants located in proximity to the central west and western coal fields, the dryer capacity should be carefully considered and one of much greater capacity should be used than where eastern coals are available. To dry Kentucky coals to about 1 per cent moisture requires 1.3 per cent of the total coal dried and for Indiana coal running about 7½ per cent moisture there is required 1.8 per cent.

Free moisture from rain and snow gives little trouble as most of it drains off before the coal reaches the dryer. The combined or inherent moisture, which is the moisture shown in analyses, can be reduced or eliminated only by the action of heat. If wet coal is fed into a furnace, heat is required to vaporize the moisture in the form of wet coal and heat that could be used for melting must be used for evaporating the water. In a melting furnace, for example, the object is to melt iron quickly and economically. The evaporation of water in such a furnace retards the melting operation. The drying of coal can best be accomplished in the dryer designed especially for the purpose.

Dry coal is more easily pulverized than is wet coal and the cost is correspondingly less. Wet coal packs quickly and has a tendency to pack and clog in any receptacles or mechanisms it passes through or is stored in. It is more susceptible to spontaneous combustion because of its tendency to pack and thus prevent the circulation of air.

The finer coal is pulverized, the more efficiently and satisfactorily it can be burned. Here again, some authorities contend that accepted practice is wrong. Again it can be said that relatively coarse coal can be burned successfully, but not nearly so economically as fine coal. For metallurgical furnaces, the standard most commonly accepted, namely, 95 per cent through a 100-mesh screen and 85 per cent through a 200-mesh screen, has proven satisfactory. Coal ground to this fineness is mostly an impalpable powder.

The object of grinding coal fine is to have the coal so prepared, with sufficient surface exposure, that instantaneous and complete combustion may be expected. If a lump of coal say 3 inches cube is fired into a combustion chamber, there is exposed 54 square inches of area to the action of heat. There is only required for combustion of these exposed surfaces a relatively small amount of air. It is known that this lump of coal will break up into many small pieces after it has been subjected to heat for a short time and when that occurs the surface exposed is many times increased. A much larger amount of air is then required to permit burning of these many small pieces.

Exposed Surface Is Increased

With coal finely ground in accordance with established practice, it is fair to assume that the average size piece will be less than 1/600 of an inch cube. Assuming this, then a lump of coal of the size of a 3-inch cube will be, when pulverized, divided into six billion pieces. These six million pieces have an area of 688 square feet whereas the 3-inch lump had an area of only 54 square inches. Is it not fair to assume that

with this greatly increased surface exposed a much quicker burning action will result?

It is well to remember also that all of the coal fed into the furnace is of approximately the same size. With hand firing each shovelful will contain many different sizes, yet before this coal can be completely consumed it must be broken down into minute particles. Time is required to permit this breaking down process and at the same time a large amount of excess air is entering the furnace in anticipation of the time when it will be required to assist in the combustion of the many small pieces. The stoker may assist the action of the heat in breaking down the lumps by poking and raking. All he can do is to assist in exposing more unburned surface for combustion. The fire tools of the stoker are not as efficient for this work as is a pulverizer. Pulverized coal when dry and finely ground is highly combustible when mixed with the proper amount of air. Theoretically, bout 140 cubic feet of air are required for complete combustion of one pound of coal. It has been found from experience that about 175 cubic feet of air per pound of coal is the proportion best suited for general purposes. There may be times when more air is wanted during a portion of the time in order to produce a decided cutting action. Again a lesser amount may be wanted if a neutral flame is necessary. With a properly designed equipment, almost any reasonable air ratio can be instantly obtained and maintained for any period.

Pulverized Coal Aids Quick Melting

In a malleable melting furnace, it is desired to heat the charge quickly and get the metal out in the shortest possible time. Pulverized coal approaches an ideal fuel to meet this requirement. To get maximum results, however, it is essential that combustion take place as near to the end of the burner as possible so that the heat can be utilized for the full length of the furnace. Therefore, as the coal enters the furnace there should be a sufficient amount of air so that each particle of coal will be surrounded by an amount of air that will permit perfect and complete combustion, but there should not be sufficient excess air to cause dilution of heat. This means for an ideal condition, a perfect mixture of coal and air.

The particles making up finely pulverized coal are more nearly uniform in size, than are the particles making up ordinary hand or stoker-fired coal. If coal is ground so that 95 per cent will pass through a 100-mesh screen then about 60 per cent of it will pass through a 300-mesh screen. In such a material then are a few particles larger than a 1/200-inch cube and many much smaller than a 1/600-inch cube. For each different sized particle a different amount of air would be required for combustion of that piece. It is unreasonable to expect any appliance or apparatus to accomplish the practically impossible feat of surrounding each of the millions of particles with the correct amount of air for perfect combustion.

Use Minimum Excess Air

Recognizing these facts, it is unreasonable to expect to melt iron quickly with coal without an excess amount of air, and this means a certain amount of oxidation loss. Keep this loss to a minimum by the use of a minimum amount of excess air, all of which should be admitted with the coal. Abandon the top blast when burning pulverized coal. With many hand-fired furnaces, top blast is necessary to deflect the gases to the charge and to protect the bungs. In doing this it cools the gases, but furnishes air also to complete combustion. It may be classed as a necessary evil. With a properly designed pulverized coal furnace, the flame is direct on the charge and no air other than that which enters the furnace with the coal is required to complete combustion.

Two general methods are used for introducing coal into a furnace. One method may be designated as the "bin system," in which pulverized coal is stored in a bin at each furnace. The coal is transferred from the pulverizer building by a screw conveyor or by compressed air, the latter being most generally used in late installations. From the storage bin the coal is withdrawn by the movement of a feed screw which usually is operated by a small variable speed motor. The feed screw delivers the coal into a chamber of special design into which compressed air or fan blast air is also admitted. The air and coal are mixed in this or additional chambers and the mixture then fed into the furnace. Some of these mixers or burners are quite complicated in design. The problem of thoroughly and completely mixing the coal and air in the correct proportions, however, must be solved if a maximum efficiency and economy is to be obtained. With the storage bin located at the furnace, this mixing operation must be accomplished in a limited space, else valuable shop space will be occupied.

The system installed in our foundries is known as the "circulating system." As previously explained, the coal is fed into a pipe through which a current of air is passing and this mixture induced through a distributing blower. While passing through the blower, the coal is unquestionably thrown to the outer periphery of the fan blades by centrifugal action, but as it is forced through the outlet pipe, it mixes with the air and is then carried in suspension to the furnaces. In this stage the mixture is in the proportion of one pound of coal to say, 35 cubic feet of air. The proportion may be changed to suit the particular furnaces or number of furnaces being operated.

This amount of air is not sufficient to support combustion. There is a mixture of coal and air circulating throughout the system. To make this mixture burn, however, there must be added a large volume of air. This is added into the burner at the furnace. In other words, the rich mixture is simply diluted by the addition of fan blast air just prior to the entrance of the mixture into the furnace. The coal and air are already intimately mixed, else the coal would not be carried in suspension. To further substantiate this statement, it may be of interest to know that the outlet for a furnace may be taken from the top, bottom or side of a distributing pipe. The air used for distributing the coal is also used for combustion so that less additional air is required at the furnace than is necessary for bin system equipment.

Regulate Air Automatically

Some engineers claim to have perfected devices for automatically controlling the proper volume of air to correspond with the coal consumed. These devices operate on the principle that a certain kind of coal requires a definite amount of air for good com-

Table I

Analysis of Coals Burned Successfully

Coal fired	Kind	Moisture, per cent	Volatile, per cent	Ash per cent	Sulphur, per cent	Fixed carbon per cent	As received	B.t.u. Dry	B.t.u. Combustible
Ky. No. 1	N. & S.	2.53	31.56	12.12	0.55	53.79	12,373	12,694	14,694
Ky. No. 2	R. M. R.	2.37	34.09	6.18	0.41	57.36	13,589	13,913	14,859
Ky. No. 3	N. P. S.	3.21	35.33	8.15	0.72	53.31	12.700	13.121	14,328
Ky. No. 4	N. & S.	3.46	31.08	13.36	0.90	52.10	11,633	12,046	13,986
Ind. No. 1	M. R.	7.50	35.69	11.31	1.26	45.50	11,265	12,166	13,675
Ind. No. 2	M. R.	8.02	34.93	9.07	1.03	47.98	11,119	12,088	13,411
W. Va. No. 1	N. & S.	6.37	31.98	11.86	0.73	49.79	....	....	....
Ky. No. 5	N. & S.	5.19	29.46	20.23	1.36	45.12	10,199	10,757	13,675
Ind. No. 3	Screen	12.34	30.93	14.52	1.58	42.21	10,258	11,633	14,025
Anth. No. 1	Culm.	4.94	8.91	24.92	....	61.23	10,289	10,814	14,699
Ky. No. 6	N. & S.	1.66	34.97	9.80	1.12	53.57	13,069	13,289	14,940

NOTE:—N. & S.—Nut and slack.
R. M. R.—Resultant mine run.
N. P. S.—Nut, pea and slack
M. R.—Mine run.

bustion. This relation is determined by trial after which the coal and air control are so connected that when an increased amount of coal is used a corresponding increased amount of air is automatically admitted. When a change of coal is made this device must be reset. It is asumed that for each unit of volume of coal a certain volume of air is required. The unit of volume is not proper for measuring the heating value of coal. If the air were governed by the B.t.u. or volatile and fixed carbon content of the coal, it would come more nearly meeting requirements. A control apparatus that would automatically increase or decrease coal or air as required to maintain furnace temperature and complete combustion, would insure maximum efficiency. Coal from the same car will vary so much that a regulator based on a volume unit appears to be of doubtful value. The experienced furnace man soon becomes accustomed to burning pulverized coal and adjusts the coal or air valves to get the desired results.

It seems unnecessary to rebuild hand-fired melting furnaces to properly burn pulverized coal, but some alterations must be made in the firebox of the furnace. The burners may be placed in the end of the furnace; the ash pit filled up; the bridge wall removed and the furnace bottom extended as far as possible. It may be necessary to increase the height of the back end of the furnace, but this will depend on the height of the firebox of the hand-fired furnace. It may also be necessary to change the height of the bridge wall which is located in the neck of the furnace. The capacity of a furnace is generally increased from 10 per cent to 20 per cent. A typical melting furnace is shown in Fig. 3.

(To Be Concluded)

Names Chairman for Coal Storage Investigation

Appointment of W. L. Abbott of Chicago as chairman of the committee to make a nation wide coal storage survey in co-operation with the United States coal commission and the department of commerce has been announced by the Federated Engineering societies. Other members of the committee will be named shortly. It is probable that the personnel will represent many groups, including coal mining, both bituminous and anthracite; transportation; public utilities; United States bureau of mines; chemical engineering economics and equipment. It is proposed to complete the survey by Nov. 1, 1923.

Chairman Abbott is a member of the American Institute of Electrical Engineers and has been a leader in the engineering movement for government reorganization sponsored by the National Public Works Department association. John Hays Hammond, chairman of the United States coal commission, believes that the engineers of the country are in a particularly advantageous position to aid the coal commission. The question of engineering co-operation has been referred to the member societies of the federation and the response has been encouraging.

The American Engineering Standards committee has assigned joint sponsorship for the standardization of engineering and scientific abbreviations and symbols to the American Association for the Advancement of Science, the National Research council, the Society for the Promotion of Engineering Education and the United States bureau of standards.

Foundry Operations at a Higher Rate

OPERATIONS of Ohio foundries in March showed a satisfactory improvement over February, in fact, the most satisfactory since last September, according to the monthly trade report of the Ohio State Foundrymen's association. During March the industry operated at 83.2 per cent of normal. This compares with 67.8 per cent of normal in February and 39 per cent of normal in March, 1922.

Based upon total capacity of all the foundries reporting, the normal melt figure for March was 25,844 tons of castings. The actual production of these foundries, however, was 22,602 tons. Thus the actual melt was 83.2 per cent. Total stocks on hand showed a further increase as compared with February, aggregating 25,617 tons. Compared with the normal melt, the stocks on hand, therefore, represented 95.2 per cent. As shown in the accompanying chart, stocks on hand are now the highest of any month during the last eight months. Stocks received in March totaled 19,406 tons and represented 73 per cent of the normal melt. For February this figure stood at about 99 per cent and for March, 1922 at about 28 per cent.

The accompanying chart prepared from monthly figures consolidated with statistics contained in the 1921 *Year Book*, shows the general trend of operations since January, 1921. It will be noted that the various lines on the chart have been working to a point where during March they all stand at about the same general positions.

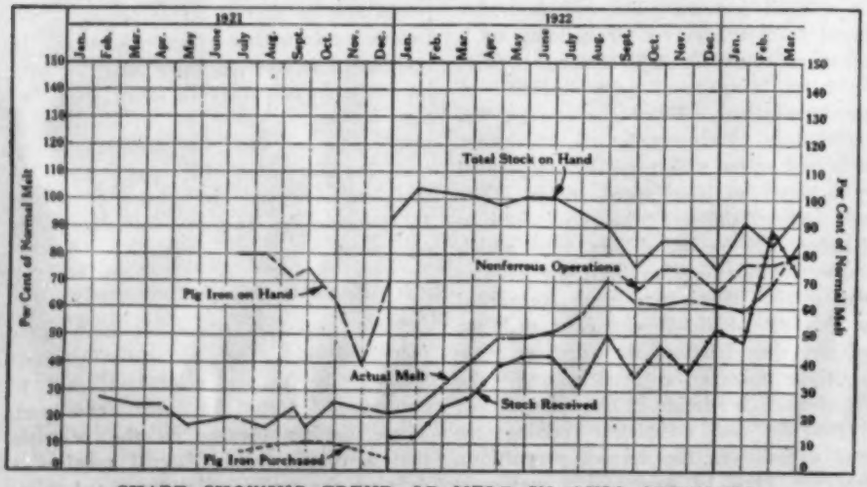


CHART SHOWING TREND OF MELT IN OHIO FURNACES

Due to the fact that beginning January, 1922, the member foundries reported iron and scrap "received" and "on hand," instead of "iron only" as in 1921, the chart showing the amounts of these materials on hand and received are not continuous. The proportionately higher values, shown since January as "stock on hand," are due to the inclusion of scrap with pig iron.

The trade report for March may be summarized as follows:

		Tons	Per cent of normal melt
Normal melt		25,844	100.0
Actual melt		22,602	83.2
Pig iron received		15,206	58.9
Spot	950.75	.....	....
Contract	14,255.25	.....	....
Scrap iron received		3,900.05	15.08
No. 1 machinery	1,876.05	.....	....
No. 1 railroad	174	.....	....
Miscellaneous	1,850	.....	....
Pig iron on hand April 1		19,929.81	77.2
Scrap on hand April 1		5,687.8	22.0

Nonferrous operations also have shared in the upward movement of the foundry activities. During March the figure increased to 80.2 per cent while in February nonferrous operations were at 76 per cent of normal.

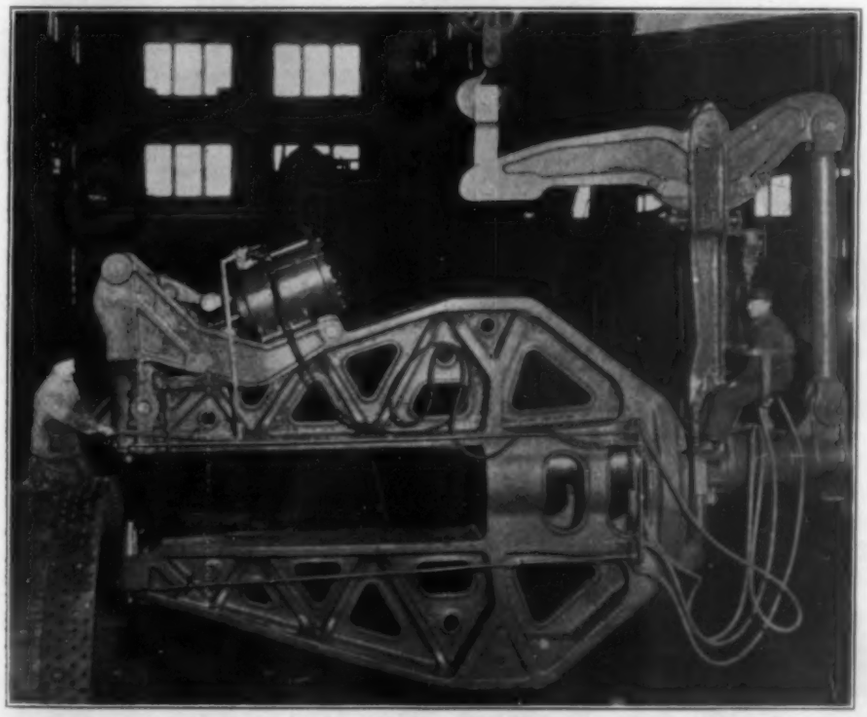
Portable Machine Rivets Large Plates

A specially built 150-ton portable pneumatic riveter of 118-inch reach and 30-inch gap recently has been completed by the Hanna Engineering Works, Chicago. The riveter, which is shown in the accompanying illustration, was built primarily for fabricating the plates forming the volute of the casing and penstock for a 70,000-horsepower hydraulic turbine. The greatest distance across the volute is approximately 48 feet and the diameter of the entrance for water into the volute is 15 feet. The plates vary in thickness from 1¼ inches at the entrance to ⅞ inch at the end of the volute with rivets of 1¼ to 1 inch in diameter and 7800 in number. Since the volute and penstock are to hold water under a pulsating pressure of about 110 pounds per square inch, the character of this work must be of boiler quality. Owing to the immense size of the volute and penstock, a portable riveter aids this work.

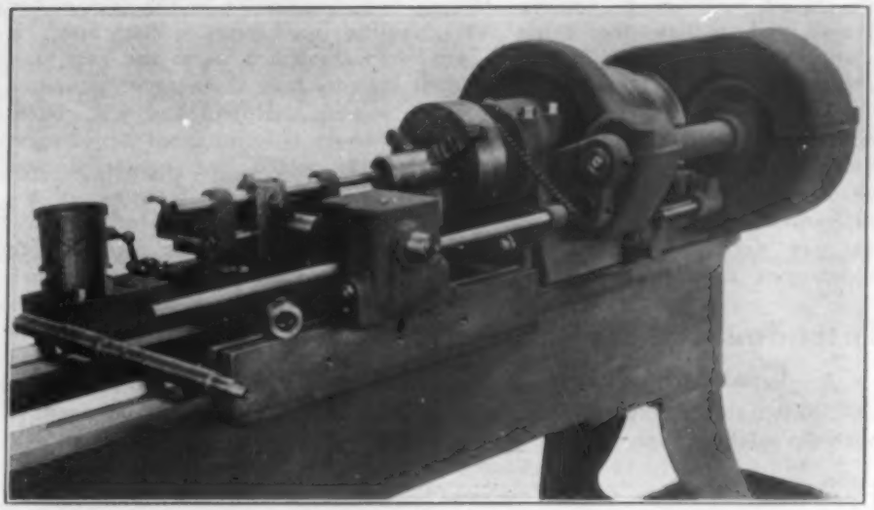
Due to the great weight, mechanical power is required to swing the riveter into position for operation. The supporting mechanism is designed so that when the riveter is thrown into any working position, the center of gravity of all the crane parts hanging on the hook is neither raised or lowered. Roller bearings are used at all points of rotation. The frame is mounted upon the spindle by two radial roller bearings and is restrained from longitudinal motion upon the spindle by roller thrust bearings.

The riveting mechanism mounted upon this machine is a combination of toggles which merge into a lever action, developing a predetermined uniform maximum pressure during the lever action. This provides for tight rivets being driven with every stroke of the piston without adjustment of the die screw being necessary to overcome variation in the thickness of the rivets, thickness of the plates, diameter of the holes, etc.

Complete manipulation of the machine is possible from one position at the head or dies, three operating handles being located here for riveting, rotating and tilting. A seat is provided near the rear of the machine from which the rotating and tilting motor valves may be manipulated when this point of control is desirable.



PORTABLE PNEUMATIC RIVETER WHICH HAS AN 118-INCH REACH AND 30-INCH GAP



ENGINE LATHE ATTACHMENT WHICH OIL GROOVES BEARINGS ON SHAFTS AND BEARINGS

Builds Device To Oil Groove Bearings

An engine lathe attachment for oil grooving any diameter bearing or shaft which can be made to revolve in the lathe on which the attachment is placed, recently has been introduced by the Mueller Machine Tool Co., Cincinnati. This device will cut oil grooves either single or double figure eight style without rechucking the piece. The cutter bar of the attachment has a double pointed cutting tool to groove consecutively on opposite sides of the hole. The lathe spindle makes two revolutions to one complete stroke of the tool on the cutting bar.

On the type of engine lathe manufactured by this company, the driving shaft of the attachment enters into the lathe head directly below the back gear pinion. A rawhide pinion on the end of the driving shaft meshes with the face gear on the lathe spindle. For other makes of lathes a chain drive is furnished with the sprocket gear placed on the nose of the lathe spindle before the necessary chuck is attached.

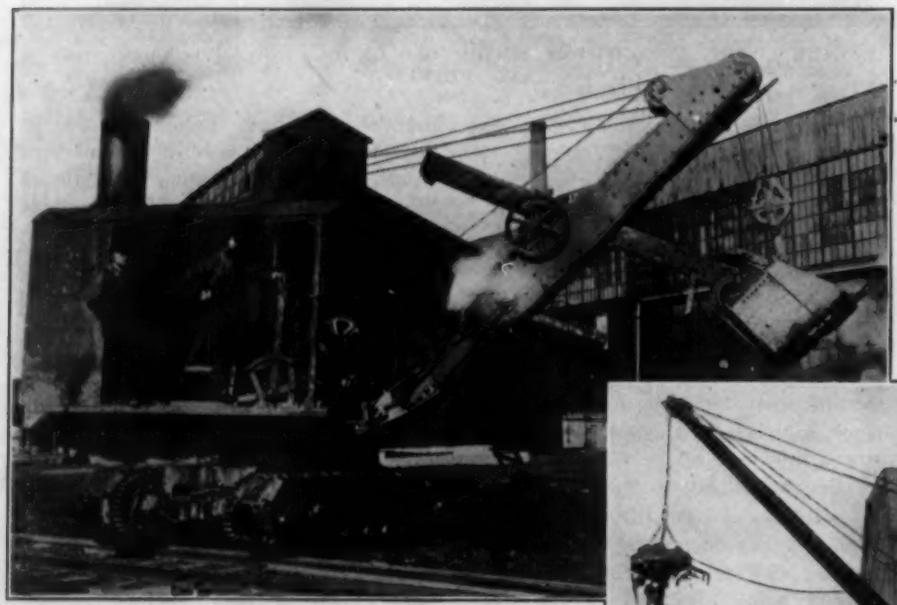
The driving shaft of the attachment is supported by an adjustable bearing and passes through the driving box of the attachment. The power is transferred to the splined shaft above by a worm and worm wheel. At the end of this splined shaft is an adjustable cross bar which acts as a crank to move a cross head for any stroke required within a range

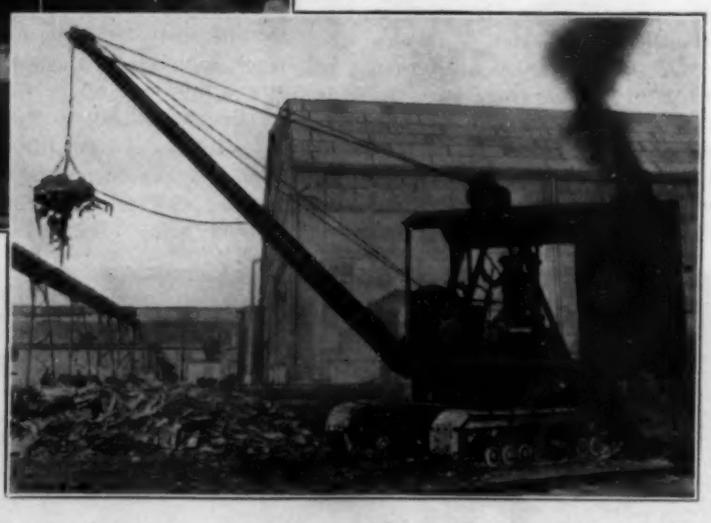
of 1½ to 6 inches in length. The cross head carries the cutter bar which travels back and forth in a support.

The cutting tool is brought to any desired position while the lathe is in motion. The cutter bar can be raised or lowered to suit the center lines of various swing lathes. A view of the new device is shown in the accompanying illustration.

Introduces New Steam Crawler Crane

A 10-ton steam crawler crane fitted with the mechanism for performing the operations of hoisting on either of the two main drums, or of operating a two-line bucket, recently has been introduced by the McMyler-Interstate Co., Cleveland. The mechanism also is capable of lowering and raising the boom, rotating the crane and traveling. Views showing the crane operating with electromagnet and shovel are shown in the illustration.





(ABOVE) STEAM OPERATED CONVERTIBLE TRACTOR CRANE SHOWING SHOVEL ATTACHMENT. (RIGHT) CRAWLER CRANE EQUIPPED WITH LIFTING MAGNET FOR HANDLING PIG IRON AND SCRAP

The various operations of this crane are actuated by a double cylinder, nonreversing steam engine. The clutches are operated by a double screw thrust mechanism which is mounted on the end of the shaft towards the operator. The clutches are exceptionally rugged and simple. Each drum is fitted with a foot-operated, asbestos-lined brake, 28 inches in diameter and having a 3-inch face. The foot levers have a lock attachment.

The boom hoist is mounted on a turntable casting at the rear of the hoisting mechanism. The hoist is driven through a worm and gear, and is engaged and disengaged by means of a right and left-hand jaw clutch. The boom is constructed of standard channels which are reinforced and braced with angles flattened at the ends. The turntables or rotating base is a heavy box section steel casting which forms the bed plate upon which the engine, hoisting and swinging mechanism are mounted. Structural wings attached to the turntable at the sides and rear support the boiler, water tank, fuel bunker and counterweight.

Each crawler tread is an endless chain or belt made up of steel castings which travel over sprocket wheels at each end of a rigid frame. Power for traveling is taken from the engine through right and left hand clutches and gears through the bed plate to the driving sprocket wheels on the crawlers. The normal hoisting speed is 200 feet per minute and the maximum single line pull is 10,000 pounds.

The Oilgear Co., Milwaukee, Wis., has amended its corporate articles fixing the capitalization at $500,000 preferred and 5000 shares of common stock without par value.

Canadian Production Is Highest Since 1920

Toronto, Ont., April 30.—Production of pig iron in Canada during March was greater than that for any month since November, 1920, amounting to 65,297 gross tons, an increase of 21,046 tons or 47.6 per cent over the February output of 44,250 tons. This output was 30.6 per cent greater than the monthly average for 1921, and was 100.9 per cent above the monthly average for 1922. Basic pig iron made in March totaled 55,008 tons. Foundry and malleable iron production, on the other hand, was less than that for February. The number of furnaces in blast continued unchanged.

The increase in pig iron output was reflected in a greater production of steel ingots and castings in Canada during March when 89,088 tons were reported, representing an advance of 91.4 per cent over the output of the previous month when 46,536 tons were made. The output for March exceeded the average monthly production of the three previous years by 41.4 per cent. Steel ingot production consisted of 85,393 tons, and was all open-hearth basic steel for steelmaking use. The February output was 43,234 tons. The production of steel castings also showed a slight increase from 3303 tons in February to 3695 tons in March.

Shortage in Alabama

Birmingham, Ala., April 30.—A labor scarcity is noted among the industries of the Birmingham district. Wages are being raised and other steps are being taken to hold workers. The Gulf States Steel Co., effective May 1, raised wages at its steel plant about 5 per cent, this making a 10 per cent increase since March 1. Common labor rates in this district have been materially increased in the past 30 days. The movement northward is not heavy from the manufacturing and mining sections of the state.

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

THE program for the spring meeting of the American Society of Mechanical Engineers to be held at Montreal, May 28 to 31, has been announced as follows:

MONDAY, MAY 28, 1923

Morning Session, 9:30 a. m.

Council meeting.

Afternoon Session

Business meeting; address by Calvin W. Rice, secretary American Society of Mechanical Engineers, on his South American trip; public hearing on power test codes.

Evening Session

Joint dinner, Council of Engineering Institute of Canada and Council of American Society of Mechanical Engineers.

TUESDAY, MAY 29, 1913

Morning Session, 9:30 a. m.

Power Development in the Province of Quebec, Julian C. Smith; The Development of Hydroelectric Power Plants in Ontario, Frederick A. Gaby; Management Engineering as Applied to the Pulp and Paper Industry, R. B. Wolf; A Practical Laboratory and Drawing Room Course in Industrial Engineering, M. A. Lee; Steel Car Construction at the Angus Shops, Canadian Pacific Railway, H. R. Naylor; Notes on Some Recent Developments in Railway Motor Cars, C. E. Brooks.

Afternoon Session

Excursions.

Evening Session

Smoking concert, Montreal branch, Engineering Institute of Canada.

WEDNESDAY, MAY 30

Morning Session, 9:30 a. m.

Bleachery Engineering and Operation, F. P. Bascom and J. C. McDowell; Port Development, R. S. MacElwee, Harbor of Montreal, Frederick W. Cowie; Modern Hydraulic Turbines of Large Capacity, H. G. Acres; Sectionalization and Remote Control of High-Pressure Steam Lines, Peter Payne Dean.

Afternoon Session

Excursions.

Evening Session

Dinner dance.

THURSDAY, MAY 31

Morning Session, 9:30 a. m.

Recent Developments in Balancing Machines, Carl R. Soderberg; Machine Tool and Paper Industry, G. E. Williamson; Chimney Design, A. Cotton; Lignite Char, O. P. Hood; Endurance Test Data and Their Interpretation, K. Heindlhofer and H. Sjovall; Mending Stresses in Curved Tubes of Rectangular Cross-Section, S. Timoshenko; Control of Flying (Contributed by Aeronautic Division).

Afternoon Session

Excursions.

A feature of the technical program will be the session Tuesday morning on hydroelectric development. Julian C. Smith, vice president and chief engineer of the Shawinigan Co. will tell of the power development in the province of Quebec and Fred A. Gaby, chief engineer of the Hydroelectric Power commission of Ontario will describe developments in hydroelectric power plants in Ontario. The two speakers are of outstanding importance in hydroelectric development work in Canada and their addresses will undoubtedly be of great interest. The second session on power will have two papers, one is by H. G. Acres, hydraulic engineer of the Hydroelectric Power commission of Ontario, who will present a paper on "Modern Hydraulic Turbines of Large Capacity." At the same session Payne Dean, president of Payne Dean, Ltd., Stamford, Conn., will present a paper on "Sectionalization and Remote Control of High-Pressure Steam Lines." Mr. Dean's contribution will deal with the problems of controlling flow of steam in high-pressure lines by means of remotely situated operating systems for valves.

* * *

Steel Treaters Meet

The regular monthly meeting of the Pittsburgh chapter, American Society for Steel Treating, was held in the Hawaiian room, William Penn hotel, on Tuesday evening, May 1. "Shop Kinks" was the subject of an address presented by practical men with wide experience in the heat treatment of steel.

* * *

Addresses Chain Manufacturers

E. J. Lowry, metallurgist, Hickman, Williams & Co., Louisville, Ky., delivered an address before the Malleable Chain Manufacturers association at Hotel LaSalle, Chicago, April 27. His subject was "Chromium in Malleable Irons Discussed from the Point of View of Both Theory and Practice."

New Interests in Control of Marquette Ore Co.

An announcement from 100 Broadway, New York, states that the Marquette Ore Co., holding company for the Mary Charlotte Mining Co., Marquette Ore Co., Washington Iron Co., and Breitung Iron Co., has passed into the hands of new interests and has been reorganized. The following executive committee is in control of the company: Joseph W. Powell, Boston, formerly with Bethlehem Shipbuilding Co., Ltd., Frederick W. Wood, Baltimore, formerly president of the Maryland Steel Co. and Charles E. Spencer Jr. vice president of the First National Bank of Boston. The company owns mines in the Lake Superior district, and it is stated that improvements have been made with a view to supplying additional tonnages of ore for shipment this season.

Convention Calendar

April 28-May 3—American Foundrymen's association. Annual convention and exhibition at Public Hall, Cleveland. C. E. Hoyt, 140 South Dearborn street, Chicago, is secretary.

May 2-4—National Foreign Trade Council. Annual convention in New Orleans. O. K. Davis, 1 Hanover square, New York, is secretary.

May 3-5—American Electrochemical society, semiannual meeting, Hotel Commodore, New York. Colin G. Fink, 327 South La Salle street, Chicago, is secretary.

May 7-9—American Association of Engineers. Annual convention at Norfolk, Va. C. E. Drayer, 63 E. Adams street, Chicago, is secretary.

May 14-16—National Association of Manufacturers of the United States of America. Annual conference, Waldorf-Astoria, New York.

May 15-16—National Pipe & Supply Association. Convention at Cincinnati. Geo. L. McIlvane, 909 Oliver building, Pittsburgh, is secretary.

May 15-17—American Iron, Steel and Heavy Hardware association. Annual convention, Drake hotel, Chicago. A. H. Chamberlain, Marbridge building, New York, is secretary.

May 15-18—National Association of Purchasing Agents. Annual convention at Cleveland. O. H. R. Heydon, 19 Park place, New York, is secretary.

May 17-19—National Supply and Machinery Dealers association; Southern Supply and Machinery Dealers association; and American Supply and Machinery Dealers association, triple convention, Cincinnati. F. D. Mitchell, 1819 Broadway, New York, is secretary.

May 28-31—American Society of Mechanical Engineers. Spring meeting at Montreal. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

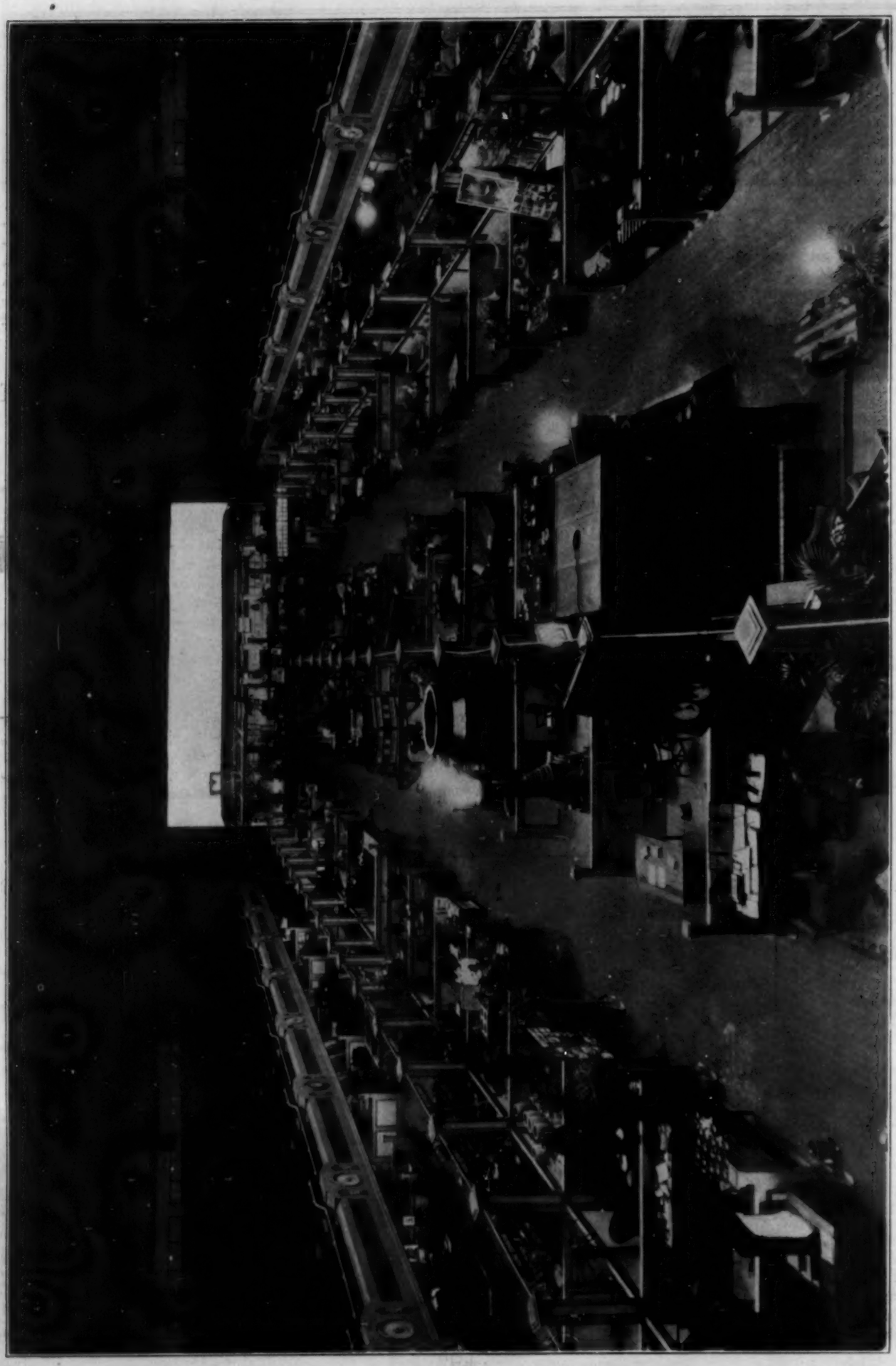
June 11-14—Electric Power club. Annual meeting, Hotel Homestead, Hot Springs, Va. S. N. Clarkson, Kirby building, Cleveland, is secretary.

June 14-15—American Society for Steel Treating. Spring sectional meeting, Hotel Bethlehem, Bethlehem, Pa. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

June 20-23—American Institute of Chemical Engineers. Summer meeting at Wilmington, Del. J. C. Olson, Polytechnic institute, Brooklyn, N. Y., is secretary.

June 25-26—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

June 25-29—American Institute of Electrical Engineers. Annual convention at Swampscott, Mass. F. L. Hutchinson, 33 West Thirty-ninth street, New York, is secretary.



GENERAL VIEW OF ARENA DISPLAY IN CLEVELAND'S NEW PUBLIC AUDITORIUM FROM NORTH END OF BUILDING LOOKING TOWARD STAGE

Exhibition Signifies Prosperity

Foundry Show of American Foundrymen's Association Indicates Confidence of Manufacturers in 1923 Casting Business—Importance of Material Hand- Is Emphasized—More Than 200 Exhibitors Represented

MANUFACTURERS of foundry and metal working equipment and supplies are confident that 1923 will be a banner year in the castings industry. Vision of future needs, enterprise in planning for them and preparedness in fulfilling them are reflected on all sides at the foundry show being held in conjunction with the twenty-seventh annual meeting of the American Foundrymen's Association at Cleveland.

As the visitor surveys the mass of equipment which is crowded into every possible square foot of space on both floors and on the stage of the auditorium, he cannot help but wonder how extensive the show would have been if the number of exhibitors and allotments of space had not been limited by the area available.

In analyzing the display of machines, tools, supplies and accessories, representing the products of more than 200 manufacturers, it is noticeable that a great many of them are directly or indirectly involved in the problem of material handling. It has been estimated that in the average foundry nearly 16 tons of material must be handled in order to produce one ton of castings. If the number of times each item of material is handled is taken into consideration the total number of tons handled rises to the rather surprising figure of over 100. That foundrymen are beginning to realize the importance of the handling problem is reflected in the unusual number of exhibits of cranes, tramrail systems, hoists, conveyors, sand handling equipment, lift trucks, tractors and trailers, charging equipment, etc. Inasmuch as the majority of this equipment is shown in actual operation, the exhibits attract unusual attention.

In the display of molding machine and molding equipment there seems to be a trend toward specialization. In several cases rather elaborate rigs for special equipment are being demonstrated. This also is true in the case of flasks and sand handling equipment. The popularity of more efficient methods of preparing molding sand was never more strongly emphasized than at this exhibition. The sand cutters shown by several companies reflect a greater degree of refinement that any of the machines exhibited several years ago. Sand blast equipment is much in evidence in the exhibition hall in the basement of the auditorium.

While the number of machine tools shown is comparatively few, a number of grinding machines, metal cutting saws, pattern making equipment, a mechanical die cutter and a wide variety of electrical and pneumatic portable tools are being exhibited. A notable feature of this year's exhibition is the emphasis placed on welding by the several demonstrations of this equipment by a number of companies. As usual, many companies are displaying metals, core compounds, sand, etc.

Methods of Handling Foundry Material Shown

WHILE the number of machine tools exhibited is not extensive several interesting models are being demonstrated. Among these is the 26-inch shaper being operated by the Ohio Machine Tool Co., Kenton, O. The Armstrong-Blum Mfg. Co., Chicago, is exhibiting an automatic power hack saw and an automatic power band saw, both in operation. Punching, bending and shearing machinery also is shown. A power hack saw in operation also is being exhibited by E. C. Atkins & Co., Indianapolis. This company also is displaying a variety of saws adapted to patternmakers' and metal workers' use.

A combined band saw filing and setting machine is being shown by the Black Diamond Saw & Machine Works, Natick, Mass., together with a circular saw-filing machine and brazing outfits. The saw filing machines are in operation. Grinding and buffing machines are exhibited by the Cleveland Armature Works, Cleveland. The Gallmeyer & Livingstone Co., Grand Rapids, Mich., is demonstrating jointers, and bench and band saws. A machine of unusual interest is being operated by the Keller Mechanical Engraving Corp., Brooklyn, N. Y. This machine is shown duplicating an intricate pattern. A leader follows over the pattern to be reproduced while a cutting tool generates the desired contours on the second pattern. It is shown that this machine is adapted for making patterns and core boxes from cement models and for duplicating finished patterns.

Grinding Equipment Shown

The Marschke Mfg. Co., Indianapolis, is demonstrating electrically driven floor grinding equipment. The Northern Blower Co., Cleveland, is showing an interesting model of an exhaust system for grinding rooms together with core room and sandblast equipment. Semiautomatic drill grinding machines are being shown in operation by the Oliver Instrument Co., Grand Rapids, Mich. A complete pattern shop in operation is included in the exhibit of the Oliver Machinery Co., Grand Rapids, Mich. The tools include band saws, jointers, etc., and an oilstone grinder. A portable band saw for cutting sprues is being operated by the Racine Tool & Machine Co., Racine, Wis. This company also is exhibiting screw cutting machines. Metal cutting machines are being operated by the Simonds Saw & Steel Co., Fitchburg, Mass.; air compressors, hoists, etc., are being demonstrated by the Sullivan Machinery Co., Chicago, and pattern shop equipment is shown by J. D. Wallace & Co., Chicago.

Considerable interesting is being shown in the various abrasive exhibits. The Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., has heavy duty floor grinders and buffers in operation, and chucks for holding sectional wheels on Pratt & Whitney and Blanchard grinders. Grinding wheels and refractory materials constitute the exhibit of the Carborundum Co., Niagara Fall, N. Y. Another feature of this display is a core oven equipped with a Cannon-type radiating furnace. The furnace burns gas, oil or pulverized fuels and is made of highly refractory carborundum materials.

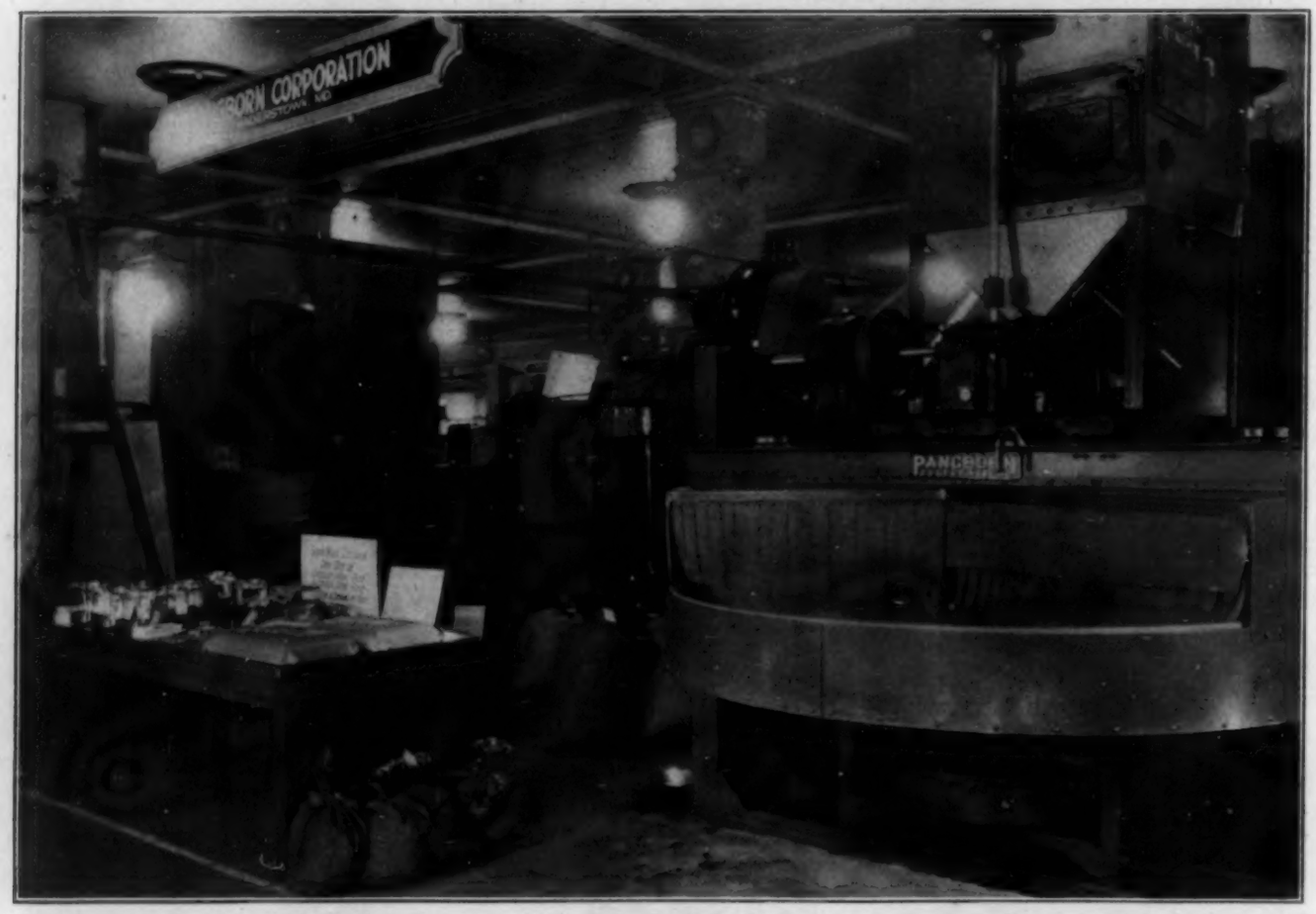
Metallic abrasives for sandblasting.

and samples of work done with this material are shown by the Globe Iron-Crush & Shot Co., Mansfield, O. The Norton Co., Worcester, Mass, is operating grinding wheels and floor and bench grinding machines particularly adapted for foundry cleaning room installations.

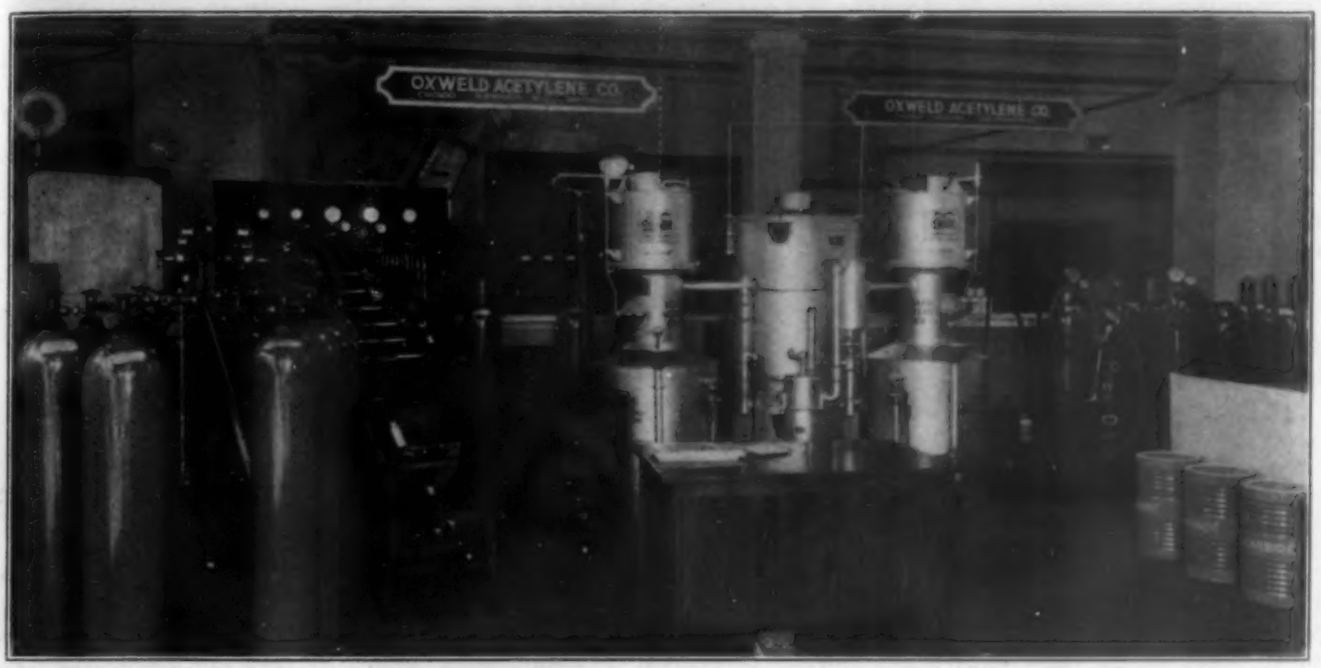
As in former years sandblast equipment is much in evidence. The American Foundry Equipment Co., New York, is operating a sandblast room, while the Hoevel Mfg. Corp., Jersey City, N. J., is showing barrel and table type machines. The MacLeod Co., Cincinnati, is demonstrating sandblast tumbling barrels and a sandblast cabinet. The New Haven Sandblast Co., is also showing sandblast equipment. The exhibit of the Pangborn Corp., Hagerstown, Md., includes a complete sandblast room and cabinet and rotary-type equipment. Sandblast cabinet and barrels also are shown by the Ruemelin Mfg. Co., Minneapolis, and the Standard Equipment Co., New Haven, Conn., while the W. W. Sly Mfg. Co, Cleveland, is demonstrating a pneumatic elevating device for use with metallic abrasives. The J. W. Paxson Co., Philadelphia, also is showing sandblast equipment and foundry supplies.

Portable tools of various types are attractively displayed by several companies. The Chicago Pneumatic Tool Co., Chicago, is showing portable grinders, hoists, rammers, etc., while the Cleveland Pneumatic Tool Co. is displaying air grinders, couplings, air lines, hammers, rammers, etc. Punches, chisels and other equipment for pneumatic tools constitute the exhibit of the Cleveland Steel Tool Co., Cleveland, and the Arrow Tools, Inc., Chicago. The Dayton Pneumatic Tool Co., Dayton, O., is showing pneumatic tools for foundry use. Portable grinders, driven by flexible shafts, are being demonstrated by the R. G .Haskins Co., Chicago. The exhibit of the Ingersoll-Rand Co., New York, includes rammers, pneumatic hammers, grainders, etc., and a two-stage air compressor in operation, while that of the Independent Pneumatic Tool Co., Chicago, includes a complete line of air drills, grinders, hoists, etc. The Master Tool Co., Cleveland, is demonstrating reclaimed pneumatic tools. C. E. McArthur, Chicago, is showing pneumatic rod cutters and straighteners. The Roto Pneumatic Co., Cleveland, is exhibiting grinders and drills, while flexible shaft grinders are displayed by the N. H. Strand Co., Chicago.

A complete substation for foundry use is shown by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The company also is operating an electric core oven and exhibiting a 75-horsepower starting panel and a 20-horsepower motor. Among other exhibits is that of chipping hammers and rammers by the George Oldham & Son Co., Baltimore; counting and weighing machine: National Scale Corp., Chicopee Falls, Mass.; pulverizers for core breaking, Standard Sand & Machine Co., Cleveland; ball mills for grinding foundry materials, the Hardinge Co., New York.; ball and thrust bearings and measuring instruments, Norma Co. of America, New York; saws and files, Henry Disston & Sons, Philadelphia, and a working model



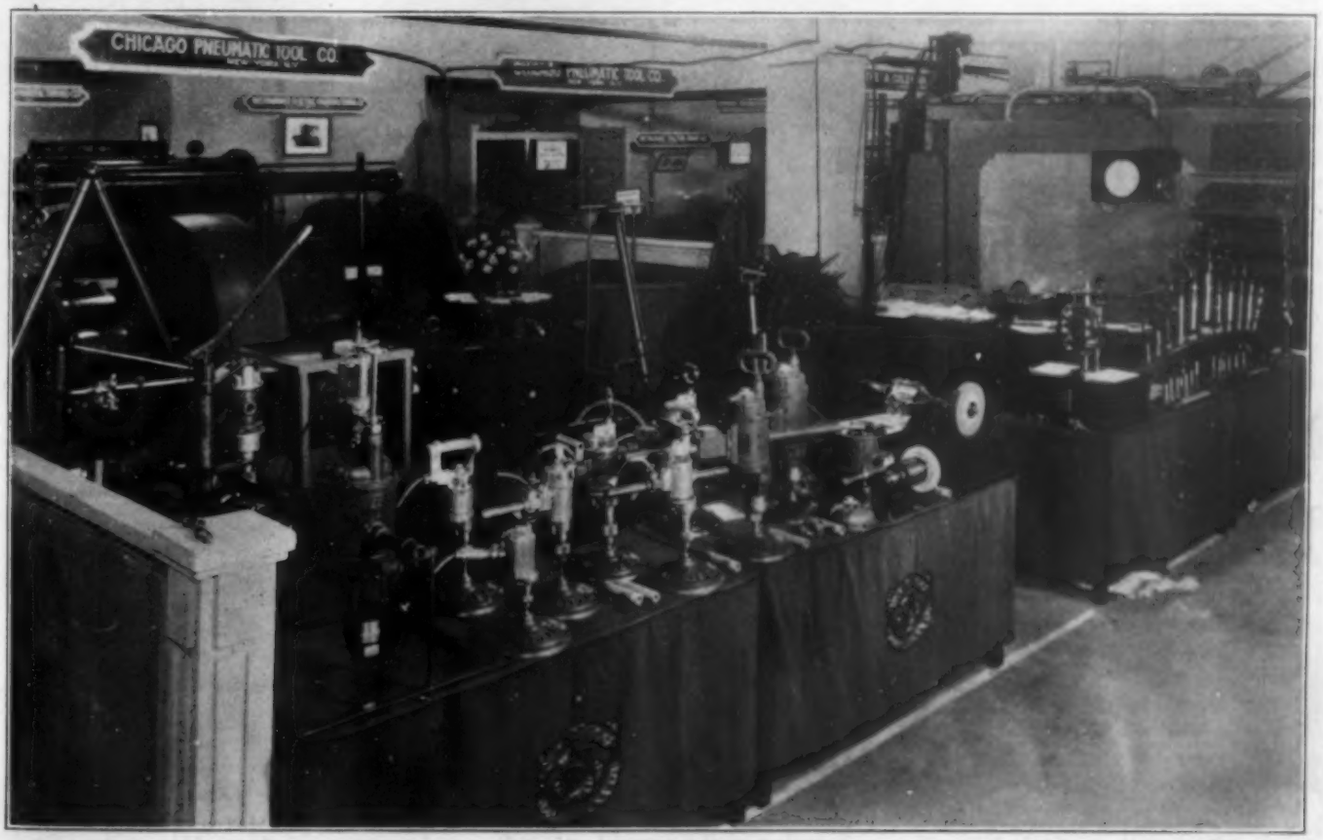
SAND BLAST EQUIPMENT IS SHOWN BY SEVERAL MANUFACTURERS AND CONSTITUTES THE LARGEST EXHIBITS IN THE EXHIBITION HALL IN THE BASEMENT. OTHER PROMINENT DISPLAYS INCLUDE SAND CUTTING MACHINERY, MOLDING MACHINES AND FLASK EQUIPMENT



WELDING OUTFITS ARE BEING OPERATED IN VARIOUS PARTS OF THE BUILDING

of a dust collecting system by the Cleveland Blow Pipe Co., Cleveland. This company also is exhibiting sand-blast cabinets.

The extensive display of trucks, tractors, monorail systems, hoists, etc., indicates the trend of foundry practice toward better mechanical methods for handling materials. The Elwell-Parker Electric Co. Cleveland, is exhibiting several battery trucks including a malleable iron pot handler for furnace changing and a truck crane with a 12-foot boom. A 2-ton lifting truck, a 3-wheel tractor and a 3-ton elevating platform truck are being shown by the Automatic Transportation Co., Buffalo. The Lewis-Shepard Co., Boston, is operating a portable elevator or stacker with new automatic safety features and a lift truck with springs for transporting core racks. The Clark Tructractor Co., Buchanan, Mich., has several types of gasoline



PNEUMATIC AND ELECTRIC PORTABLE TOOLS FOR FOUNDRY AND MACHINE SHOP USE ARE MUCH IN EVIDENCE

A VIEW OF THE ARENA, LOOKING FROM THE STAGE END TOWARD THE ENTRANCE

tractors on display including a locomotive type lift truck, an automatic dump tractor and a hand hoist truck.

An internal gear tractor and a special type trailer is shown at the booth of the Mercury Mfg. Co, Chicago, Ill. The Atlas Car & Mfg. Co., Cleveland, is exhibiting a low lift truck and flat platform truck. The Lakewood Enginneering Co., Cleveland, has a 4-wheel drive, 4-wheel steer tractor and a trailer on display. The Chisholm-Moore Mfg. Co., Cleveland is showing chain hoists from ½ to 40-ton capacity suspended on an I-beam structure. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., is operating a cage controlled 2-ton monorail hoist with electric magnet attached, a standard crane trolley, a 2-ton floor controlled I-beam trolley and other equipment. An interesting exhibit of I-beam and box track, two and three way switches, ball bearing trolleys, etc., is being shown by Richard-Wilcox Mfg. Co., Aurora, Ill. Hayward Co., New York, is operating an electrically driven clam shell basket and cable take up reel. Link-Belt Co., Chicago, is showing a small electric hoist with magnet attachment in operation together with a sand mixer. One type of monorail electric hoist is in operation at the booth of the Stamp Electric Hoist Co., Cleveland. An electric elevator, monorail type of pig iron and molten metal carriers, and a swinging steel crane is displayed by the Louden Machinery Co., Fairfield, Iowa. Overhead monorail systems, trackage, switches, ball bearing carriers of 2-ton capacity, and carriers equipped with electric hoists are featured by the Cleveland Crane & Engineering Works, Wickliffe, O. Victor R. Browning, Cleveland, is exhibiting an electric overhead crane while the G. H. Williams Co., Erie, Pa., features clam shell buckets of from ½ to 2-yard capacity together with small operating models.

Interest is attracted to the booth of the American Foundry Equipment Co., New York, where sand cutting machines of various types, hand operated molding machines, snap flasks, pattern frames, core machines, a down draft sand blast room with rotary table, etc., is shown. A core sand mixer with screen and motor attachment is shown by the Blystone Mfg. Co., Cambride Springs, Pa. The Whiting Corp., Harvey, Ill., is displaying powdered coal equipment, a sand cutter, tumbling mill and ladle. Royer Foundry & Machine Co., Wilkes-Barre, Pa., features several types of sand separators and blenders. A Muller type mill sand mixer for facing and core sands is operated at the booth of the National Engineering Co., Chicago. The exhibit of C. O. Bartlett & Snow Co., Cleveland, consists of two sections of an endless mold conveyor and a device for tempering sand. An electric sand shifter is operated at the booth of the Vibrating Machinery Co., Chicago. The Sabin Machine Co., Cleveland, is showing one-man factory lifting trucks and steel barrels, while the Cleveland Wire Spring Co., Cleveland, is displaying steel boxes and barrels, core racks and a steel barrel truck.

Molding Equipment Refinements Mark Exhibits

EXAMPLES of molding machines being demonstrated by the various manufacturers show no practical difference from those exhibited at preceding conventions. In a few instances refinements and improvements had been incorporated either in the design or in the method of application and in all instances the machines are in charge of experienced operators and kept in motion for the benefit of the spectators.

In addition to pattern draw and combination squeeze and stripping plate machines, the Berkshire Mfg. Co., Cleveland, has an extensive display of aluminum snap flasks, vibrators and flask fittings. An interesting demonstration of multiple molding is attracting considerable attention in the booth of the Grimes Molding Machine Co., Detroit. John A. Rathbone, the inventor of the process, has suitable equipment attached to one of the rollover machines and a demonstration constantly is in progress. A gate of castings made by the process is presented in evidence of the efficacy of the method.

A perfect working model of a rollover jar machine, taking a flask about 10 inches square, is employed by the Hermann Pneumatic Machine Co., Pittsburgh, to demonstrate the ease and particularly the accuracy with which the machine functions. The demonstrator rolls the pattern and plate back to the ramming position after the mold is lowered away, then elevates the pattern again and once more raises the mold until the pattern is bedded in place. The half split pattern is provided with flanges and pockets at each end and yet when it is once more lowered away, the surface of the sand is in perfect condition, indicating the ex-

treme accuracy with which the table is centered over the pattern draw plunger.

Something new in the method of applying vibrators is being demonstrated by the Malleable Iron Fittings Co., Branford, Conn. Many foundries charge iron and steel shavings and chips by packing them in containers, usually sections of stove pipe or tin cans of any description. Iron chips pack fairly well but it always has been a problem to pack long curl steel chips solidly in the cans. In the present method, the container is placed on a table provided with a vibrator and as the material is poured in at the top the motion induced by the vibrator packs it solidly. It is claimed that the contents of the can may be increased by from 10 to 25 per cent and in addition the material is not in so much danger of oxidizing as if it was packed loosely.

Among the many machines shown by the Osborn Mfg. Co., Cleveland, the greatest amount of attention seems to center around one with a lifting capacity of 5000 pounds operated electrically throughout. The machine is of the direct draw, rollover jolt type and illustrates the latest development in a field in which the company has specialized for several years. A flask filling machine also is shown to demonstrate how easily this feature may be adopted to a miscellaneous class of castings.

Exhibits Molds for Wheels

Development of the molding machine in the production of molds for chilled-iron car wheels has been comparatively so backward that the new machine equipped with a pattern for molding car wheels, exhibited by the Wm. H. Nichols, Inc., Brooklyn, is of interest to visitors. This machine is of the jolt, squeeze, strip type, heavily constructed. The Davenport Machine & Foundry Co., Davenport, Ia. is showing a new power jolt squeeze machine equipped for hand stripping.

The International Molding Machine Co., Chicago, has developed a machine for jolting molds for castings up to five or six hundred pounds. This is a portable machine and replaces the former type which was stationary. The machine for drags is of the rapid jolt hand stripper type, while the cope machine besides jolting the mold has a power rollover attachment, replacing the former hand rollover mechanism, and is equipped with a foot draw and automatic vibrator.

The power squeezer machine which the Arcade Mfg. Co. has made for a number of years for squeezing both the cope and drag at the same time has been equipped with a jolt attachment and a power draw mechanism. Wm. Demmler & Bros., Kewanee, Ill., is showing core fillers.

Furnaces have been prominent at previous exhibitions but equipment is not so much in evidence this year. Several manufacturers call attention to their equipment by means of photographs and literature, while others are displaying products made in their furnaces.

The Monarch Engineering & Mfg. Co., Baltimore, is showing tilting and stationary crucible furnaces, an iron pot tilting aluminum furnace, a soft meal furnace, a double chamber brass furnace and small tilting and stationary iron cupolas. A combination core oven for all fuels, sand mixer and a fume hood for small furnaces also are displayed. The Buckeye Products Co., Cincinnati, is showing oil and

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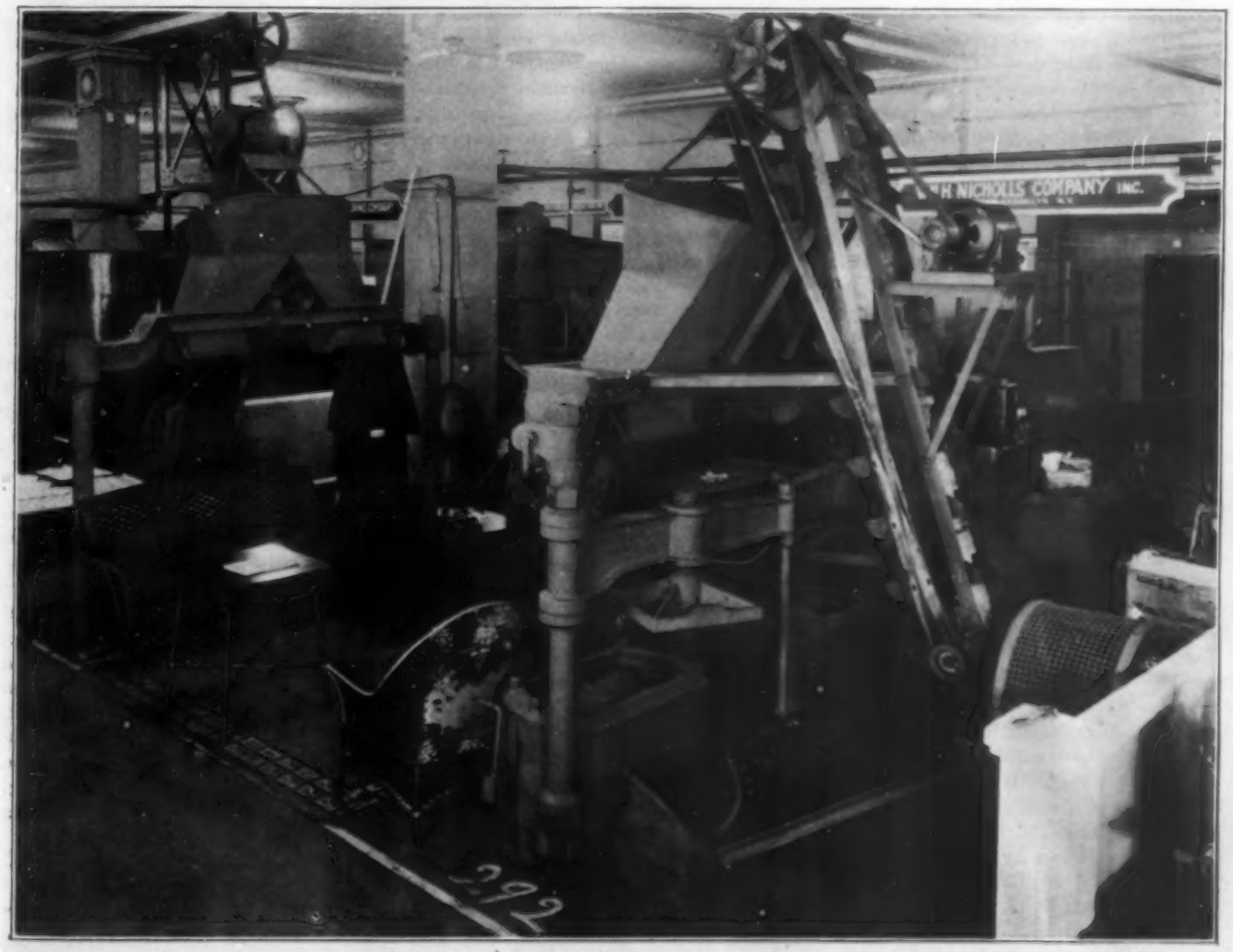

PRACTICALLY ALL OF THE EXHIBITS OF MOLDING MACHINES ARE WORKING EXHIBITS, WITH EXPERT OPERATORS IN CHARGE

Reviews Furnace Developments

Members of the American Institute of Electrical Engineers Discuss Problems of Electric Furnace Design and Operation at Pittsburgh Convention—See Development of Superpower System in Future

MORE than 900 delegates were present at the spring convention of the American Institute of Electrical Engineers which was held at the William Penn hotel, Pittsburgh, April 24 to 27, inclusive. Tuesday morning was given over to registration and to the reception of delegates by committees of electrical engineers represented by the Pittsburgh section. The convention was opened in the afternoon by E. C. Stone, chief, electrical planning division, Duquesne Light Co., Pittsburgh and general chairman of the convention committee who turned the chair over to Frank B. Jewett, president of the national body and vice president of the Western Electric Co., New York.

President Jewett told of the advancement made in electrical science during the past 10 years and emphasized the importance of electrical engineering as a profession. Super-power systems are a necessity in these days of constantly increasing use of electricity, continued Mr. Jewett, and the planning, designing and carrying through of plans for the building of super-power systems to furnish electricity for the homes, offices and shops must be considered seriously.

"General Considerations in Grounding the Neutral of Power Systems" were presented by H. H. Dewey, power and mining engineering department, General Electric Co., who asserted that in the early days of power transmission, there was no consistent practice in respect to operating with neutral isolated or with neutral grounded. Other speakers and their topics on Tuesday afternoon's program included W. W. Lewis, power and mining engineer department, General Electric Co., on "The Neutral Grounding Reactor;" J. M. Oliver, operating engineer, and W. W. Eberhardt, electrical engineer, Alabama Power Co., on 'Operating Performance of a Peterson Coil;" and a committee report on "Present Day Practics in Grounding of Transmission Systems." Dr. C. P. Steinmetz, chief consulting engineer, General Electric Co., was unable to attend on account of illness. His paper entitled "Third Class Conductors and Mechanism of Arcing Ground," however, was read at the evening session by E. E. F. Creighton. "Surges on Transmission Lines," were discussed by J. Slepian, research engineer and J. F. Peters, electrical engineer, Westinghouse Electric & Mfg. Co.

Wednesday morning's session was opened by a paper entitled "Some Fuel Determinations Made on Locomotives Operated by the Southern Pacific System" which was presented in abstract owing to the author, A. H. Babcock, electrical engineer, Southern Pacific railroad, San Francisco, having been unable to attend the convention.

Discuss Electric Furnaces

When operating electric furnaces of the ordinary ferroalloy type, it often is necessary to know in advance what a furnace will do under changed conditions. That the general performance of a three-phase electric furnace can be determined in advance with a large degree of accuracy by using the simple equations of a balanced three-phase system, was brought out by F. V. Andrae, chief engineer, Southern Manganese Corp., Anniston, Ala., who presented "Some Problems in Electric Furnace Operation." He developed the general equations of the three-phase furnace based upon the theory that the reactance of a three-phase electric furnace does not depend upon the load but is a constant depending on the arrangement of the conductors. Due to the fact that the main conductors carrying the current from the interlaced bus cars to the furnace are more or less in one plane, he pointed out that a transformer action is introduced between phase 1 and phase 3, taking power away from 1 and transporting it to 3. The phase rotation being 1, 2, 3. This power, he declared, may be considerable.

When voltages between phases and currents are balanced the power delivered by the three electrodes is quite unbalanced, a fact that is very apparent in large furnaces, electrode 1 seeming dead while electrode 3 takes most of the power. Nevertheless, when only voltage, current and total power are concerned, simple expressions can be used are entirely satisfactory in practice. The author suggested a few methods to reduce the unbalancing of the load. He showed that the load must be considered as connected in star the bottom of the furnace being the neutral, and that the electric energy is transformed into heat energy in three separate zones situated under the three electrodes.

That the structure and arrangement of electric furnaces for reducing ores and remelting and refining metals present interesting problems was brought out in a paper entitled "Improvements in Ferroalloys Electric Furnaces of High Power Input" by B. D. Saklatwalla and A. N. Anderson, Vanadium Corp. of America, Bridgeville, Pa. The authors stressed the importance of efficiency of power input in ferroalloys furnaces and discussed the electrical factors to be considered in the design of the leads for achieving such efficiency. A new system of regulation was explained whereby the furnace temperature is maintained constant by keeping the energy input constant by means of true watt regulation. The authors submitted several factors in design and construction which help to keep the load factor of the operation as close to 100 per cent as possible. C. T. Guilford, general engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh presented a paper on "Heating a Cotton Weave Shed by Electricity."

Wednesday morning's session was closed by Frank Hodson, president, Electric Furnace Construction Co., Philadelphia, who spoke on "Development of the Large Electric Melting Furnace." He asserted that mechanically there is no reason why electric furnaces cannot be built as large as open-hearth furnaces and if the three-electrode limitation in size is removed a new field of design and utility will be opened for the large electric furnace. During his discourse the speaker cited the advantages of correct heat application in the large furnace and spoke of the possibility of using large electric units as an intermediate process for the manufacture of cheap steel.

Wednesday afternoon's session was given over to the consideration of relays for the protection of transmission lines. In speaking on "Selective Relay System of the 66,000-volt Ring of the Duquesne Light Co.," H. P. Sleeper, protection engineer of this company, presented numerous schemes of relays to secure protection and pointed out their advantages and disadvantages. P. Ackerman, Shawinigan Water & Power Co., Montreal, Quebec, gave a paper on "Ground Selector for Underground Three-Phase Distribution Systems." Leslie N. Crichton, Westinghouse Electric & Mfg. Co., in his paper on "The Distance Relay for Automatically sectionalizing Electrical Net Works," described a new relay for automatically sectionalizing transmission line preliminary work performed in planning the auditorium of the Eastman theatre, Rochester, N. Y., and the lighting

to be used during the exhibition of motion pictures so as to eliminate all possibility of visual fatigue was described by F. A. Mott, manager, construction department, Wheeler-Green Electric Co., and L. A. Jones, physicist research laboratory, Eastman Kodak Co., Rochester, N. Y., in their Rochester, N. Y., in their paper entitled "The Electrical and Illuminating Equipment of the Easteman Theatre and School of Music.

At the banquet Wednesday evening, at which more than 700 engineers attended, the development of a national unified power system, whereby the water power resources of the nation may be developed to supply cheap power, was urged. Wider and wider use of electricity at more economical rates so the industrial supremacy of America may be maintained, coupled with inter-connection of distant plants so as to conserve the fuel supply and make for more reliability in service, followed by complete electrification of all industries and railroads, were tendencies stressed by R. F. Schuchardt, chairman of the power survey committee of the Great Lakes division, National Electric Light association.

Paul T. Brady, speaking of the special development of the superpower plan, stated there need be no fear that the engineering brains would not solve all future problems.

The final session of the convention, was held Thursday morning at which the following papers were presented: "Survey of Lightning Disturbances on a Destribution System" by M. MacLaren, professor of electrical engineering, Princeton university; "Experience with Reactors" by N. L. Pollard, consulting engineer, Public Service Production Co., Newark, N. J.; "Short Circuit Forces on Reactor Supports' by R. E. Doherty, designing engineer and F. H. Kierstead, engineer, General Electric Co., Schenectady, N. Y.; and "Proposed Insulator Tests and Specifications" by P. Junkersfeld, chairman of the working committee on insulators of the standards committee. Thursday afternoon plants were inspected.

Chambers Approve Trade Associations

Washington, May 1.—Business organizations affiliated with the Chamber of Commerce of the United States have, by good majorities, approved all of the eight proposals relative to trade associations submitted at the recent referendum. These proposals are:

"Because of numerous useful and important functions of obvious propriety, trade associations should exist for each important branch of industry and commerce.

"A trade association should have such membership that it can be representative of the industry in connection with problems affecting the general advance of the industry.

"A trade association should be prepared to consider all problems affecting the general advance of its industry or branch of commerce.

"Trade associations should continue free from special forms of governmental control.

"Statistics of capacity, production, stocks and sales should be collected by a trade association for its industry or branch of commerce.

"Statistics of actual prices in closed transactions should be collected by a trade association for its industry or branch of commerce.

"Any interpretation of statistics or other comment which could induce or facilitate concerted action on the part of members should be omitted by a trade association.

"Statistics of production, capacity, stocks, sales and prices a trade association should make as available to the public and to government agencies interested in following the course of the industry and commerce as to members."

Beehive Coke Output Has Fair Weekly Gain

Washington, May 1.—The production of beehive coke increased during the third week of April. Using as a basis the number of cars loaded by the principal coke carriers the total output was estimated by the geological survey at 437,000 net tons, against 421,000 tons in the week preceding. The increase was made in Pennsylvania and the West. The middle and southern Appalachian states showed decrease. The comparative weekly figures follow:

	Week Ended		
	April 21 1923	April 23 1923(a)	April 22 1922
Pennsylvania and Ohio.	357,000	337,000	69,000
West Virginia	25,000	27,000	6,000
Alabama, Kentucky, Tennessee and Georgia...	23,000	27,000	9,000
Virginia	17,000	17,000	5,000
Colorado and New Mexico	9,000	8,000	2,000
Washington and Utah..	6,000	5,000	3,000
United States total.....	437,000	421,000	94,000
Daily average	73,000	70,000	16,000

(a) Revised from last report.

Preliminary estimates of the output of bituminous coal for the week ended April 28, show an increase over the preceding week. Production is placed at about 10,400,000 tons against 10,244,000 tons in the week ended April 21.

Takes Oven Contract

The Koppers Co., Pittsburgh, has received a contract from the Diamond Alkali Co., Pittsburgh, covering the design and erection of 37 combination coke and gas ovens of the Koppers improved type to be built at Alkali, O., together with by-product and motor fuel plants.

American Firm Shares in Glasgow Order

European Staff Correspondence

London, April 19.—The ability of American steelmakers to compete in European markets under certain conditions is strikingly illustrated by bids recently opened in Glasgow for furnishing several hundred tons of frogs, crossings, etc., to the Glasgow municipal street railways. There were four bidders, the United States Steel Products Co., being low with a quotation of £3592 ($16,700), with the Titan Track Work Co., Ltd., Sheffield, next with a bid of £4066 ($18.900). The other bidders were Hadfields Ltd., Sheffield, £4118 ($19,200), and Edgar Allen & Co., Ltd., Sheffield, £4145 ($19,320). The work was distributed between all four bidders, labor members on the Glasgow council objecting to placing it all in the United States.

Places Sheet Mills

Contracts for six sheet mills to be installed at the new plant of the Metal & Thermit Corp. at South San Francisco, Cal., were let last week to the National Roll & Foundry Co., Avonmore, Pa. The new units include six 30-inch finishing and three 30-inch roughing stands together with a stand of pinions and two 26-inch cold mills. The National company recently started an order through its shops for twenty 26-inch cold mills for installation at the Ashland division of the American Rolling Mill Co., Ashland, Ky.

Gulf States Shows Gain

Net income of the Gulf States Steel Co., Birmingham, Ala., for the first three months of 1923, amounting to $533,978, compared with $80,316 for the corresponding period of last year and with $399,942 for the final quarter of 1922. First quarter earnings this year were at the rate of $4.43 a share and are more than one-third larger than for the preceding quarter.

Rates Ordered Reduced

The Pennsylvania railroad has been directed by the public service commission of Pennsylvania to reduce its rates on steel plates, bars and rivets from the Pittsburgh district to the Hammond Iron Works, Warren, Pa. The reductions are from 25 cents per 100 pounds for carload and 37 cents for less carload lots to 18.5 cents for carloads and 22 cents for less carload shipments. The railroad complained that competitors in Oil City, Titusville, Corry, Sharon, Greenville, Meadville and Sharpsville, Pa., were given lower rates.

Exhibit Reflects Air of Prosperity

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gas-fired crucible and noncrucible nonferrous furnaces. Air and electric sand riddling machines, core oils, core and parting compounds, and refractory cements also are shown.

Noncrucible and crucible tilting types of melting furnaces and tilting type aluminum melting furnaces using cast iron melting pots make up the display of the Campbell-Hausfeld Co., Harrison, O. The Ajax Metal Co., Philadelphia, shows its type of electric induction furnaces. It also displays nonferrous and babbit metals. Brass melting furnaces, stationary and tilting aluminum melting furnaces, two types of core ovens, core racks, a coremaker's bench and lift truck are exhibited at the booth of F. A. Coleman Co., Cleveland. A 6-inch oil burner nozzle with turbine drive for malleable iron annealing furnaces and a motor driven gas and oil burner for 10-ton malleable melting furnaces are shown by the Maxon Furnace & Engineering Co., Muncie, Ind. The Hauk Mfg. Co., Brooklyn, is showing cupola lighters, mold dryers, ladle heaters and new low and high pressure furnace burners for core ovens. Other equipment includes welding preheaters and an automatic open-hearth burner.

Young Bros., Detroit, are displaying a model of a conveyor type, oil-heated core oven, a trolleyless type drawer oven for any kind of heat and an automatic electric oven for experimental baking. Foundry Equipment Co., Cleveland, shows a core rack and a rolling door type core and mold drying oven with a drawer puller.

Tilting furnace brass crucibles and a new type crucible is shown by the Joseph Dixon Crucible Co., Jersey City, N. J. Crucible and furnace cements are exhibited by the Lava Crucible Co., of Pittsburgh, while the Chicago Crucible Co., Chicago, is displaying crucibles and stopper heads. The Modart Co., St. Louis, demonstrates the use of a cupola tapper and stopper.

One of the features of the show is a talking cupola at the booth of the Quigley Furnace Specialties Co., New York. This company describes the cement and refractories used in the cupola and pouring spout by means of an amplifying horn concealed in the blast pipe. The effect is that of a radio receiver. An operating model of a pulverized coal system for a malleable foundry is the display of the Bonnot Co., Canton, O. Robert Gordon, Inc., Chicago, shows a quarter size working model of a hot blast heater for industrial establishments.

Among the exhibitors of temperature recording apparatus is Leeds & Northrup Co., Philadelphia, and the Taylor Instrument Co.'s Rochester, N. Y. Pyrometers and pressure and volume gages are exhibited by the Bacharach Industrial Instrument Co., Pittsburgh. is displaying crucible and stop- in miscellaneous foundry equipment such as sands, core oils, core binders, sand cutters, safety equipment, and facings are displaying their products in an attractive manner. The exhibits by companies dealing in nonferrous metals attract considerable attention.

In illustrating the new features of material designed for plant construction and maintenance, the David Lupton's Sons Co., Philadelphia, is showing for the first time a continuous top hung sash with no lower projection thereby eliminating corrosion, and the Skybryte Co., Cleveland, is demonstrating the application of its prepared powders and solutions for cleaning factory and foundry windows encrusted with dirt and grime. The Arex Co., Chicago, has installed for demonstrating purposes a model of its smoke exhauster.

Miscellaneous Supplies Exhibited

Bethlehem Steel Co., is showing a group of photographs of the mining and reduction of ores from Cuban mines, and also has on display nodules and ore from its mines. Truscon Steel Co., Youngstown, among its line of foundry equipment which is on display, is showing a pressed steel flask which had been used in the production of 3750 cylinder castings.

A lump of coal about 125 cubic feet in size is part of the material being shown by S. Obermayer Co., Chicago. A guessing contest is being held for the closest estimate of the weight of the coal. It is a specimen from the mines of the Westmoreland Coal Co. from which sea coal facing is made.

To visualize more fully the methods of cutting lumber for patterns, the Dock & Mill Co., North Tonawanda, N. Y., is showing a 12-foot log, three feet in diameter, with the various cuttings marked on the ends, together with samples of soft white pine cut from a similar log. Carter Bloxonend Flooring Co., Cleveland, is offering for exhibition three panels of flooring made by its methods and the Thomas E. Coale Lumber Co., Philadelphia, is showing pattern and flask pine and pattern mahogany woods. The exhibit of the Sterling Wheelbarrow Co., Milwaukee, comprises a variety of wheelbarrows and trucks, foundry flasks, wedges and shop boxes.

Over $1000 worth of gold bar, silver bar and granulated silver feature the booth of the Balbach Metals Corp., New York. A variety of castings from antimony lead are arranged to show the scope of work being done in casting that metal. A copper ingot is twisted and drawn to show the tensile strength and the elongation of the metal. Ingot brass and bronze with rough and finished products made from similar ingots comprise a part of the exhibit of the Michigan Smelting & Refining Co., Detroit. S. Birkenstein & Sons, Inc., Chicago, are showing virgin and refined nonferrous metals and the British Aluminum Co., Ltd., New York, is exhibiting aluminum castings and bars. Aluminum castings of a large variety of commodities from adding machine cases to vacuum cleaners may be found in the booth of the Doehler Die Casting Co., Brooklyn, N. Y. The Ajax Metal Co., Philadelphia, is showing specimen castings and alloys for babitting. White & Bros., Inc., Philadelphia, are showing samples of castings of copper, together with ingots of manganese bronze and white metals.

Seven samples of shoes for foundry services are being displayed by Safety First Shoe Co., Boston. Waldo, Egbert & McClain, Buffalo, has in its booth a variety of coke and pig iron grades. The Spencer Turbine Co., Hartford, Conn., is demonstrating the use of turbines which it manufactures and P. H. & F. M. Roots Co., Connersville, Ind., are demonstrating the operation of a working model of a rotary blower.

Air Reduction Sales Co., New York, is demonstrating the oxygraph and camagraph together with welding apparatus. The General Electric Co., is showing semiautomatic arc welding equipment. Some of the other companies displaying welding apparatus and equipment are, Electric Welding Machine Co., Detroit, Super Arc Machine Co., Detroit, Oxweld Acetylene Co., Chicago, and Gibb Instrument Co., Bay City, Mich.

Norway's Output Given

Statistics of Norwegian production for 1921, just issued in a volume published by the central statistical bureau in Christiana, records the following figures of mining returns: Copper ore, 14,135 tons with a value of 869,000 kronen; nickel ore, 2141 tons with 118,000 kronen value; iron ore, 54,975 tons having 1,403,000 kronen value; zinc and lead ore of 7 tons, value not stated; and titanium, 2567 with a value of 49,000 kronen.

Obituaries

FLOYD CHARLES FURLOW, president of the Otis Elevator Co., New York, died at his home in Montclair, N. J., April 19, after a long illness, aged 46. Mr. Furlow was born in Americus, Ga., and graduated from Georgia School of Technology in 1897. After his graduation he took a course in Worcester Polytechnic Institute and also received considerable education in Europe. During 1900-1902 he lectured in the Georgia School of Technology on experimental engineering. Then he became chief engineer of the Plunger Electric Co. at Worcester, Mass., of which company he became vice president in 1904. The following year he became connected with the Otis Elevator Co. as general manager and vice president of the company and in 1918 he was elected president which office he held until the time of his death. Telegrams of sympathy and condolence were received by the Furlow family from President Harding, General Charles G. Dawes and many others. President Harding sent a floral tribute.

John Tilbert Ward, for the past 30 years treasurer of the Babcock & Wilcox Co., New York, died April 22 at his home in Glen Ridge, N. J. He was 68 years old.

W. T. Short, chief metallurgist of the Wilson Foundry & Machine Co., Pontiac, Mich., died at his home in that city recently. He was a native of England.

Edward T. Ripley, president and one of the founders of the Ripley & Bartlett Co., Plymouth, Mass., maker of tacks and nails, died unexpectedly at his home in that city, April 26. He was 71 years old.

Randolph Troy, sales manager of the transformer specialty department of the Pittsfield, Mass., works of the General Electric Co., died at a hospital in that city, April 26. He was 33 years old.

Henry H. Skinner, president of the Hendee Mfg. Co., and president of the former Harley Co., both of Springfield, Mass., died unexpectedly in that city, April 26. He was 65 years old. He had been president of the Torrington Co. and several other manufacturing interests.

Porter B. Yates, president and general manager of the P. B. Yates Machine Co., Beloit, Wis., died April 27 in a Chicago hospital from pneumonia. Mr. Yates was born in New York state in 1854 and went to Wisconsin in 1875, locating in Berlin, where his father conducted a hardware store. In 1884 he founded the Berlin Machine Works, which he moved to Beloit in 1887 and developed into a large industry. In 1905 a Canadian factory was opened at Hamilton, Ont. The name was changed to P. B. Yates Machine Co. in 1914.

F. E. Leonard, president of E. Leonard & Sons, Ltd., London, Ont., engine and boiler manufacturer, died April 20 following an illness of three weeks. He was 75 years old. Mr. Leonard was prominently connected with several other industrial firms and took an active interest in civic affairs.

Charles P. Burgess, manager of the San Francisco plant of the Pacific Coast

CHARLES P. BURGESS

Steel Co., San Francisco, and president of the Steel Mill & Foundry Supply Co., died recently following a short illness. He was 48 years old and was born in Taylorsville, N. C. At one time he was connected with the Birmingham Rolling Mill, Birmingham, Ala., which was acquired by the Republic Iron & Steel Co., Youngstown, O. Later he went to St. Louis for the Republic company as general superintendent of the western district. Later he joined the St. Louis Screw Co. For the past seven years he had been connected with Pacific Coast Steel Co. and was held in the highest esteem by the directors and officers of the company as well as his many business associates and friends.

Robert H. Stockton, president of the Majestic Mfg. Co., St. Louis, died in that city April 27. He was 80 years old, and had been ill for three years from the effects of a fall. He was born at Mount Sterling, Ky., but came to St. Louis shortly after the Civil war. His first work was with the Simmons Hardware Co., which company he left to organize the Majestic Mfg. Co., and it was largely through his genius that the latter corporation was brought to its present importance in the stove industry. Mr. Stockton was widely known as a philanthropist.

James Lord, who was president of the American Iron & Steel Mfg. Co., Lebanon, Pa., for 10 years before it was acquired by the Bethlehem Steel Corp. in 1917, died April 22. He was 79 years old having been born at Camden, N. J., in 1844. He was educated at St. John's college, Annapolis, Md., and from 1872 to 1882 he was employed at the Reading Bolt & Nut Works, and from 1882 to 1899 was general manager of the Pennsylvania Bolt & Nut Co. In 1899 he became general manager of the American Iron & Steel Mfg. Co., which was organized at that time to take over the Pennsylvania Bolt & Nut Co. and several other companies making bolts, nuts and rivets with plants in Reading and Lebanon, Pa. In 1907, Mr. Lord became president of the company. He served in the army during the Civil war and was interested in both military and patriotic clubs and societies.

Welding Society Elects

The American Welding society, in annual convention at the Engineering societies building, New York, has elected the following officers: President, P. F. Barton, master mechanic of the Delaware, Lackawanna & Western railroad; vice president, Pacific coast region, A. V. Thompson, General Electric Co.; vice president, Southern region, C. L. Jones, Westinghouse Electric & Mfg. Co. Four directors were elected as follows: C. A. Adams, R. S. Smith, A. M. Candy and C. J. Holslag.

A discussion of recent developments in the fields of electric, gas, resistance and thermit welding, and to the activities of the bureau of welding, which handles the research work of the society, were features of the program. The welding of unfired pressure vessels and the training of welding operators also were discussed. About 150 members were in attendance. Trips of inspection were made to the Third Avenue railway to the plant of the Oxweld Acetylene Co., Newark.

Grace Declares Better Earnings Are Ahead

The first quarter of 1923 brought marked improvement of earnings and favorable prospects for future profitable business, according to President E. G. Grace, of the Bethlehem Steel Corp. in a statement following the meeting of the company's directors.

There has been no real slackening in demand, said President Grace, although there were a few instances where buying was smaller than in recent months. This was because mills had so much business that the buyers would have to wait for a long time for delivery so they preferred to wait before making commitments.

Discussing prices Mr. Grace said he expects them to continue firm for some time. The increase in wages of 11 per cent is estimated to add $2 a ton to production costs of finished steel products but he believes that the increase in billing prices resulting from completing old low price contracts would at least equal the added costs. The volume of orders booked and being booked, requires capacity operations of the steel properties, with every indication that this condition will continue.

The Midvale and Cambria properties, Mr. Grace said, were taken over officially on March 30. The developing and modernizing of the Cambria property to perform its proper function in rounding out Bethlehem's business will be accomplished as rapidly as conditions will permit. This work on the Lackawanna plant is underway.

Regarding the outlook for labor, Mr. Grace said he saw no trouble ahead. The situation has improved as a result of the recent wage increase and the industry has passed the period when men leave the mills for outdoor work. In answer to questions, Mr. Grace said that his company was employing about 1000 Mexicans in the mills. These men, he said were doing satisfactory work; in fact, he added, they were doing better than expected. They are receiving the same wages as are the Americans. Most of them are in the unskilled labor class, he said, but some have done so well that they have been advanced.

Colorado Fuel Net Up

The first quarter report of the Colorado Fuel & Iron Co. shows gross receipts of $11,259,580, against $6,575,661 in the same period last year. Net earnings, after payment of operating expenses, totaled $1,395,359, against $596,243 the year before. After crediting other income and deducting income taxes, reserves for sinking fund and depreciation and other charges, a surplus was reported of $382,713, against a deficit after similar deductions of $431,269 in the corresponding period in 1922.

Sheet & Tube Issues Its First Quarter Report

The Youngstown Sheet & Tube Co., has made public its first quarterly income statement showing gross income for the period ended March 31 of $4,714,259. The figures include one month's operations of the Brier Hill Steel Co. properties, which have been acquired by the Sheet & Tube company. The surplus for the quarter of $2,048,566. The March interest on Brier Hill company's issue of $10,000,000 of 5½ per cent mortgage bonds is accounted for in the statement. The report follows:

Gross income	$4,714,259.25
Deduct:—	
Depreciation and exhaustion minerals	995,351.82
Net income	3,718,907.43
Less bond interest	54,183.31
Net profits	3,664,724.12
Provision federal tax	454,000.00
Preferred dividend	987,606.00
Common dividend	1,162,158.00
Surplus for year	2,048,566.12

Cramp Earnings Rise

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, shows a sharp gain in earnings for 1922 in the annual report just issued. Surplus after interest and taxes was $2,922,418 against $1,355,475 in the previous year. The company's final surplus account at the close of the year was $5,017,448.

American Chain Gains

The American Chain Co., Inc., Bridgeport, Conn., reports for the year ended Dec. 31, 1922 shows an operating profit of $1,960,453; depreciation $775,998; miscellaneous charges, $184,080; net profit $1,000,375; dividends, $629,535; surplus $370,840; profit and loss surplus $6,396,827.

Drilling for Iron Ore

Drilling in the Loon lake district east of Port Arthur, Ont., has been started by the M. A. Hanna Co., Cleveland, to determine the character of the iron ore formation there. Options were taken on some lands of the Canadian Iron Co. It is not known if the ore is sufficiently concentrated for mining on a commercial basis. A similar venture was undertaken by another American company in the Port Arthur district two years ago.

Annual Needs

Of Fertilizer Manufacturers Under Consideration At Present

New York, May 1.—Fertilizer manufacturers are commencing to figure on their annual requirements of sulphate of ammonia, but contract prices have not as yet been announced by the various producers. The market, however, continues at $3.20 to $3.25, f.o.b. works, on domestic business for nearby, and is a trifle easier at $3.70 to $3.75, port, in double bags, on export. As little spot buying prevails these prices are largely nominal. Few supplies are available for nearby. This scarcity is due largely to shipments being made on contracts placed last year.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia (delivery in two or three months)	$3.20 to 3.25

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Light oil distillates are unchanged as follows: Pure benzol, 30 cents works in tanks and 35 cents in drums; 90 per cent benzol, 27 cents in tanks and 33 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; pure xylol, 30 cents in tanks and 35 cents in drums; and commercial xylol, 26 cents in tanks and 34 cents in drums. Scarcity prevails in toluol and solvent naphtha.

Ball and flake naphthalene are holding respectively at 11 cents, works and 10 cents. With the cleaning season at hand, demand is more active, and a shortage prevails.

Penn Seaboard Has Gain

Gross earnings of the Penn Seaboard Steel Corp., Philadelphia, for the first three months of 1923 amounted to $1,045,039 compared with $307,198 in the corresponding period last year. The balance for the first quarter of this year, after deduction of all expenses and charges, amounts to $44,443 against a loss of $171,466 in 1922.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

MORRIS METCALF has been elected treasurer of the American Bosch Magneto Corp., Springfield, Mass. He was born in Providence, R. I., and received his education in the private schools of Boston and Massachusetts Institute of Technology. His first business position was with Stone & Webster. In 1896 he entered the employ of the Illinois Steel Co., Chicago, and took part in the early experiments in making cement from blast furnace slag. These resulted later in the organization of the Universal Portland Cement Co. Mr. Metcalf remained with this company for 20 years as assistant to the president. He was instrumental in forming the Portland Cement association. In 1916 he went to New York to become vice president and later president of the International Steel Corp., a subsidiary of the American International Corp., engaged in exporting steel and steel products. Upon the collapse of foreign trade in 1921, the American International Corp. withdrew from the steel business, and after a successful liquidation of his company Mr. Metcalf entered the employ of the Guaranty Trust, Co., New York, going to South America on a financial mission for this bank in 1922. Mr. Metcalf's predecessor, George A. MacDonald is president of the Chicopee National Bank of Springfield, Mass., and his many interests made it impossible for him to give sufficient time to the Bosch company. However, Mr. MacDonald still retains office, as vice president.

Louis C. Pawelk has been appointed assistant superintendent of the Burnside Steel Co., Chicago.

Henry J. Steffen, general superintendent of the W. S. Tyler Co., Cleveland, recently was tendered a banquet by his fellow workers in honor of his 50 years service with the company.

Henry M. O'Grady has been appointed sales agent in Richmond, Va. and adjacent territory for the H. E. Marks Corp., Pittsburgh. His headquarters are at 1234 Mutual building, Richmond. William B. Smith has been appointed district sales representative for the company in Texas and Louisiana with headquarters at San Antonio, Tex.

Arthur J. Nelson, who has been district sales manager at New York for the Bridgeport Brass Co., Bridgeport, Conn., has been appointed sales manager of the fabricating division of the company and in the future his headquarters will be at Bridgeport. He has been succeeded as New York district manager by F. Morton Clark.

Allen B. Coffman has resigned as sales engineer for Crouse-Hinds Co., Syracuse, N. Y., to become Philadelphia district manager for the Reliance Electric & Engineering Co., Cleveland. Previous to his association with the Crouse-Hinds company Mr. Coffman was assistant electrical engineer for the Philadelphia & Reading railroad for about four years, previous to which time he was connected with the electrical department of the Pennsylvania railroad. He is a graduate of Pennsylvania State college and for some time was employed in the factories of the Crocker-Wheeler Co. and the Wagner Electric & Mfg. Co. Mr. Coffman's headquarters will be in Philadelphia, in the Perry building, Fifteenth and Chestnut streets.

A. L. Schieber, formerly manager of the generator section of the power department, Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed export representative of that department. This is a newly created position. Mr. Schieber is well fitted for the position, since in connection with his former duties he had considerable contact with foreign work. He came to the Westinghouse company after graduating from Ohio State university in 1911. Mr.Schieber will be suceeded as manager of the generator section by Willard Lofton, who for some time has been in active charge of the work under Mr. Schieber's direction. Mr. Lofton is a graduat of the Mississippi Agricultural and Mechanical college of the class of 1917. He came to the Westinghouse company directly upon graduation.

John Mellor, effective May 1, resigned as president of the New Process Copper Castings Co., Pittsburgh, and has been succeeded by William Smith who has resigned as general master mechanic of the Midvale Steel Ordnance Co., Coatesville, Pa. Mr. Mellor will become treasurer of the company succeeding John Bramer who will continue as secretary and will also assume management of the foundry. Mr. Smith is widely known among blast furnace men having been engaged in blast furnace and steel plant work for the past 23 years. He was general master mechanic of the Jones & Laughlin Steel Co. at its Eliza furnaces, resigning in 1913 to accept a similar position with the Pennsylvania Steel Co., Steelton, Pa. Mr. Smith is well fitted to direct the manufacture of copper castings for blast furnaces and with Mr. Bramer will give his attention to perfecting the several improvements of the late James Smith, particularly his invention for casting bosh-plates containing no anchors.

Fred C. Stiening recently resigned his position with the Thomas Spacing Machine Co., Pittsburgh, as chief engineer.

Roger Warren has been promoted superintendent of mill No. 3, Spencer, Mass., works of the of the Wickwire Spencer Steel Corp., Worcester, Mass.

William C. Louis, formerly district manager for the Jos. Schoenthal Co., has become identified with the B. D. Howe Co., dealers in scrap iron and steel, 2002 First National Bank building, Detroit.

Thomas N. Anderson, late general manager of the American Can Co. at Hamilton, Ont, has taken an important executive position in the company's New York offices.

Frank C. Lewis has been appointed secretary and treasurer of the Steel Fence Post Manufacturers' association, with headquarters in the Crilly building, Chicago. He is well known in the iron and steel trade.

Carl M. Hansen, vice president of the American Re-Insurance Co., Philadelphia, has been appointed the representative of the National Association of Manufacturers on the American Engineering Standards committee.

J. D. Fleming, former vice president of the Lalance & Grosjean Mfg. Co.,

New York, has become identified in a special capacity with the sales department of the Baltimore Tube Co., Inc., Baltimore.

John Furey has been appointed manager of the Griswold, Richmond & Glock Co., Hartford, Conn., sheet metal worker.

Thomas Prentice has resigned as mechanical engineer of the Peck, Stow & Wilcox Co., Southington, Conn., and has been succeeded by Everett White.

Samuel Ferguson, secretary of the Connecticut Electric Steel Co., Inc., Hartford, Conn., has been elected president of the New England section of the National Electric Light association.

H. A. Burns, for the past two years vice president and general manager of the New Home Sewing Machine Co., Orange, Mass., has resigned to accept a position in New York.

A. C. Colby, for the past two years engaged in private business, has returned to the Marshall & Huschart Machinery Co., Chicago, as a sales representative. He will work in and around Milwaukee.

Hugh Forsythe, superintendent of the Fannie furnace of M. A. Hanna & Co. at West Middlesex, Pa., has resigned. As yet, his successor has not been named.

James H. Tobin, for several years chief engineer of the Rex Typewriter Corp., at Fond du Lac, Wis., has organized the Tobin Tool & Die Co., at Fond du Lac. He came to Fond du Lac from Shelton, Conn., in 1918.

George N. Jeppson, secretary and works manager of the Norton Co., Worcester, Mass., was tendered a dinner and presented with a malacca cane by his associates, April 13, the occasion of his fiftieth birthday anniversary.

L. B. Winton, general manager, and H. V. Slawson, assistant superintendent, of the Stanley Insulating Co., Great Barrington, Mass., have resigned. Herbert B. Smith, formerly superintendent of the company, is to re-enter its employ.

G. W. Huston of the engineering sales department of the Berger Mfg. Co., Canton, O., is now in charge of the company's office located in the Walder building, Rochester, N. Y. Mr. Huston will specialize on building division products.

Robert F. Eissler, who during the past two years has acted as assistant to the vice president of the Chicago Pneumatic Tool Co., New York, at his own request recently assumed his former position as district manager for the company at Pittsburgh. He has been desirous of returning to more active sales work for some time. Nelson B. Gatch, who has been district manager at New York, succeeds Mr. Eissler as assistant to the vice president, while William C. Straub has been appointed manager at New York succeeding Mr. Gatch.

Charles Skidd, who has been president and general manager of the Charles Skidd Mfg. Co., Janesville, Wis., recently acquired by the H. H. Miller Industries Co., Canton, O., has become production and sales manager of the Skidd products department of the Miller company.

L. R. LeMoine, for many years president of the United States Cast Iron Pipe & Foundry Co. has been elected chairman of that company. N. F. S. Russell was elected president to succeed Mr. LeMoine. Mr. Russell long has been a prominent figure in the cast iron pipe industry and for some years has been vice president of the company in charge of sales.

Richard F. Grant, vice president of the M. A. Hanna Co., Cleveland, has been elected president of the Cleveland chamber of commerce, succeeding Newton D. Baker, secretary of war in the Wilson cabinet. E. S. Jordan, president of the Jordan Motor Car Co., Cleveland, was elected second vice president of the Cleveland chamber.

Andre Citroen, French automobile manufacturer, who has returned to New York after visiting most of the large automobile plants throughout the country, said he was impressed most by his visit with Henry Ford. Mr. Citroen announced that with the support of American capital he intends to build a new plant and he hopes to deliver his first American made car next spring.

J. Carlton Ward has been made general superintendent of the Pratt & Whitney Co., Hartford, Conn., with which company he has been connected since 1918 in the capacity of industrial engineer and plant engineer. He is a graduate of Cornell university and in 1914-1915 was connected with the International Paper Co., New York, as technical engineer in its bureau of tests. During 1916-1917 he was with the Niles Tool Works, Hamilton, O., where he learned the machine tool business and during 1918 he served the government at Watervliet arsenal, Watervliet, N. Y. Later he joined the Pratt & Whitney company's staff.

Transportation Problems Are Discussed

One of the features of the three day session of the automotive transportation division of the Society of Automotive Engineers held in Cleveland April 26-28, was the discussion of the co-ordination of the railroad and motor truck transport in facilitating short haul and store door deliveries. The need for co-operation between street railways and motor busses was stressed by C. D. Emmons, president of the United Railway & Electric Co., Baltimore, and also president of the American Electric Railway association, in his address on April 27. Speakers at the banquet Thursday evening included Alfred H. Swayne, vice-president of the General Motors Corp., and W. J. L. Banham, of the Otis Elevator Co., president of the Associated Traffic Clubs of America.

A. J. Scaife, of the White Motor Co., Cleveland, spoke at the opening session of the convention. His address was concerned with the recommendations for economic operation and control of truck fleets. J. F. Murphy, of the Columbia Terminals Co., another speaker at the opening session, described the operation of an organization engaged in the transfer of freight between nine railroad depots in St. Louis. S. Von Ammon, of the United States bureau of standards presented the results of exhaustive tests on motor truck rear axles in the army transport service.

Lead Production Larger

Washington, May 1.—Production of domestic desilverized lead in 1922 totaled 468,746 tons as compared with 398,222 tons in 1921 and 476,849 tons in 1920. Foreign desilverized lead for the same years amounted to 63,916 tons, 50,367 tons, 52,808 tons, respectively. Antimony lead production dropped from 12,535 tons in 1920 to 10,064 tons in 1921 and to 8075 tons in 1922. Apparent consumption of refined primary lead in the United States totaled 492,705 tons in 1922, 444,872 tons in 1921 and 538,020 tons in 1920. Exports of domestic lead in 1922 doubled those of 1920, 5823 tons having been shipped from this country in the former year and 2730 in the latter.

The average selling price in cents per pound in 1922 was 5.5, as compared with the price of 4.5 in 1921 and 8.0 in 1920. The leading producing states are, Missouri, Idaho, Oklahoma and Utah, each averaging more than 50,000 tons per annum for the past three years.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE placing of a contract for 4000 tons of structural steel with the Worden-Allen Co., Milwaukee, by the Ford Motor Co. interest, reveals information concerning important developments of the big sawmill and automobile body plant built at Iron Mountain, Mich., two years ago. The present sawmill and body factories will be materially enlarged and a complete new body shop will be built. Other new buildings include a power house, a maintenance building and machine shop, a distillation plant and a carbonization works. This is the largest individual contract ever placed with the Worden-Allen Co., which fabricated and erected all of the steel for the initial buildings at Iron Mountain. No formal estimates of the cost of the new work have been given out, but it is believed this will range upward of $2,000,000.

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THE Norton Co., Worcester, Mass., has voted to spend $165,000 for extensions to its electric furnace plants in Chippewa, Canada. The principal addition will be a 70 x 150-foot furnace building. Other small additions for storage of material and considerable rearrangement will be necessary to insure a 25 per cent increase in production.

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THE Willys Overland Co., Toledo, has authorized the expenditure of $450,000 on an addition to the Wilson Foundry & Machine Co., Pontiac, Mich. The plans include an addition to the assembly plant and milling room where engines are made and will increase the output of engines to 500 daily. The addition will be ready by July 30. The plans call for purchases of many boring and milling machines which will cost approximately $175,000.

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AT THE annual meeting of the Jenkins Machine Co., Sheboygan, Wis., it was decided to concentrate all effort on the manufacture of woodworking tools and machinery. The sale of the engine stop patents and business to the Gas Combustion Co., Pittsburgh, was confirmed. A. G. Stuedeman was re-elected president and general manager. G. R. LaPage, sales manager, was elected vice president, and Karl E. Fricke, secretary. T. R. Stuedeman was chosen treasurer. A. M. Mattison, president of the Mattison Machine Co., Rockford, Ill., and George Purdy, president of the Greenlee Bros. & Co., Rockford, were elected directors, together with Mr. Stuedeman and E. A. Zundel, president of the Crocker Chair Co., Sheboygan.

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NEW BRITAIN MACHINE CO., New Britain, Conn., has elected officers, as follows: Chairman of the board of directors, John H. Goss, vice president of the Scovill Mfg. Co., Waterbury, Conn.; chairman of the executive committee, E. Allen Moore, president of the Stanley works; president and treasurer, Herbert H. Pease; secretary, R. S. Brown; assistant treasurer, R. S. Howe; assistant secretary, R. C. Frisbie. The latter two are newly created positions.

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CITY officials of Madison, Wis., have been advised the Chicago & Northwestern railroad will spend about $500,000 in erecting and equipping new shops in the Monona yards this year. A conference was held May 1 between city and road officials on the project. The work includes a 30-stall roundhouse, a modern machine and repair shop, car foreman's shop and a railroad ice house. F. J. Zoelle is general agent of the Northwestern at Madison.

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THE entire assets of the bankrupt Perfex Radiator Co., Racine, Wis., automobile, truck and tractor radiators, were purchased for $125,000 by M. M. Alexander of Milwaukee, acting for Racine and Milwaukee capital. These interests have organized the Racine Radiator Co., with a capital of $35,000 preferred and 2000 common shares without par value, to operate the plant, which has been a going concern throughout the proceedings. Fred M. Young of Milwaukee, who was general manager for the receiver, Willis E. Keats, becomes president and general manager of the new corporation.

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THOMPSON & JAMES, 656 Leader-News building, Cleveland, have been appointed exclusive sales agents in northern Ohio for the Blackwood Electric Steel Corp., Parkersburgh, W. Va. The Blackwood company which specializes in the manufacture of electric steel castings and recently completed the erection of a new plant now is in production. The sales company in which C. A. Thompson and W. T. James are partners, also represents the Transue & Williams Steel Forging Corp., Alliance, O., the National Drawn Steel Co., East Liverpool, O., and the Boston Pressed Metal Co., Worcester, Mass.

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DWIGHT P. ROBINSON & Co., Inc., New York, have started work on the design and construction of a complete new switching plant to replace and extend the present facilities of the Narragansett Electric Lighting Co., Providence, R. I. The work includes a 4-story building and a smaller 3-story extension to the present switch-house. These buildings will house complete new switching equipment and switchboard. The company at present generates about two-thirds of its current and obtains the other third from the New England Power Co. over 60,000 volt lines. All power will be distributed from the new switching station to substations at 11,000 and 22,000 volts. In order to provide for future expansion all equipment will be designed for 22,000 volts.

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TWO large contracts for furnace equipment recently were booked by F. J. Ryan & Co., Wesley building, Philadelphia. One from the Hupp Motor Car Co., is for equipment for a complete new heat treating plant to be erected at Jackson, Mich. In this plant will be installed two large automatic continuous furnace units, each unit composed of a heating, quenching, and drawing unit, each 75 feet in length. There also will be one automatic continuous normalizing furnace, a heat treating furnace, one cyanide treating furnace, one standard hearth type treating furnace, complete air and oil systems, quenching oil, cooling systems and water cooling systems for normalizing temperature of quenching oil. The second contract is from the Reading Hardware Co., Reading, Pa., and calls for complete equipment for a new foundry. This includes an annealing furnace of cast iron, a furnace for rust proofing, one carbonizing furnace, three electric core ovens, 10 oil-fired brass furnaces and one automatic dipping and japanning furnace.

Water Power

Increased By New Installations In Quebec—Locomotives Ordered

Toronto, Ont., April 30.—Contracts have been placed for all machinery for the third great hydroelectric installation on the St. Maurice river, Quebec, which when completed will raise the total development on the river to over 500,000 horsepower. The hydraulic machinery will be built by the Dominion Engineering Works, Ltd., of Montreal, and the electrical equipment by the Canadian Westinghouse Co. The contract is for a total of 120,000 horsepower in four units of 30,000 each.

An order for 20 Mikado type locomotives has been placed by the Canadian Pacific railway with the Montreal Locomotive Works. Six single steel snowplows will be constructed at the Angus shops, Montreal.

Testifying before the house of commons committee on mines and minerals, E. J. Garland, of Bow river, Alberta, submitted a detailed statement to show that Alberta coal could be brought from any average point in the providence and laid down at Ontario points for $4.62 per ton.

E. N. Rhodes, president of the British-American Nickel Corp. Ltd., announces that the Murray mine and smelter plant at Sudbury, and the refinery at Deschenes, Quebec, which have been closed for two years will be reopened shortly. Charles A. Rose of New York, has been appointed general manager.

Philip Mond and D. Owen Evans, of London, England, directors of the Mond Nickel Co. have inspected the company's plant at Coniston in the Sudbury district. Production has been increased and smelting operations are now in progress at the rate of between 35,000 and 40,000 tons per month. An addition to the flotation mill is being built and also an addition to the sintering plant, and another converter is being installed.

Walker Bros. of Hoquiam, Wash., have acquired the plants of the Schaake Machine Works, the Shore Bolt & Nut Co. and the Standard Pacific Motor Works of Vancouver. The three plants will be consolidated under the name of the Haynes Boiler & Engine Co., and $200,000 will be spent on new machinery and equipment. The company will specialize in the manufacture of a new type of boiler and steam engine.

The dominion government purposes to go ahead with the construction of a floating drydock at Vancouver, to cost $2,500,000. The dock will contain 5,000,000 feet of lumber and 25,000 tons of steel. The plant will include machine shops, the largest of which will be 60 x 250 feet, and plate and blacksmith shops.

Contract Is Awarded for Detroit Strip Mill

Detroit, May 1.—Work will begin this week on the erection of three building units of the newly formed Detroit Steel Corp., with a capital of $500,000 for the manufacture of strip steel. The new plant will be located on a site of 12 acres on Fort Boulevard in Oakwood, along the main line of the Michigan Central railroad. The buildings respectively will be the pickling plant and storeroom, 80 x 150 feet; the cold rolling, mill 80 x 250 feet and the annealing plant and shipping room 50 x 150 feet.

Contracts for motors and electric equipment have been signed with the Central Electric Co., while the E. W. Bliss Co., Brooklyn, N. Y., will furnish the machinery. Swindell Bros., Pittsburgh, will furnish the rolls.

The corporation officers include: President W. C. Schrage, now secretary-treasurer of the Craine Schrage Steel Co., this city; vice president, Arthur Olson, formerly of the Columbia Steel Co., Elyria, O.; secretary Arthur Schrage, vice president Craine-Schrage Steel Co., and treasurer, Anthony Bodde, Detroit real estate dealer. Clyde Craine, president of the Craine-Schrage Steel Co., is a director in the new corporation.

Ship Steel to St. Louis

St. Louis, May 1.—Three barges of steel for St. Louis manufacturers, towed by the steamer ALIQUIPPA of the Jones & Laughlin Steel Corp.'s fleet, arrived here recently. A two day public demonstration was planned by the chamber of commerce and various other organizations to celebrate what is hoped to be the permanent restoration of water transportation on the Mississippi and Ohio rivers.

The trip of approximately 1151 miles from Pittsburgh to St. Louis by water in greatly reducing the costs of transportation will enable the St. Louis industries to grow and develop with rapidity.

New York Wages Higher

New York, May 1.—Workers at manufacturing plants in New York state during March received average weekly wages of $26.92, an increase of $1.05, compared with February. Part of the gain was due to the reduction in the February average because of the holidays.

Labor Scarcity

Hinders Shipment of Refractories—Production Continues Heavy

Pittsburgh, May 1.—Labor shortages continue to hamper the shipment of refractories although consumers have not as yet found it necessary to issue any calls of distress. Practically all have enough on hand for their regular needs. Production of both fire clay and silica brick continues at about 10 per cent below the general operation schedules of the iron and steel industry, steel production being maintained at around 90 to 95 per cent. It is not expected that when the April figures are compiled they will measure up to March, particularly with reference to new orders, but occasional orders for 200,000 to 500,000 brick still are noted. From time to time an order for a complete blast furnace lining is awarded and a few orders lately have had to be placed for repair brick of fairly large dimensions. Prices are unchanged on the basis of the last advance. Car placements are far from satisfactory and in some directions stocks in makers' sheds are growing abnormally.

Chrome brick is much more active than magnesite, although a single carload order for the latter is noted from time to time. In chrome, orders placed recently involve 50,000 to 250,000 brick. One or two requirements of similar size now are under negotiation.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Maryland, No. 1	51.00 to 55.00
Maryland, No. 2	44.00 to 48.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 48.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	38.00 to 43.00
Missouri, high grade	48.00 to 50.00
Maryland, No. 1	50.00 to 53.00
Maryland, No. 2	44.00 to 45.00

SILICA BRICK

Pennsylvania	$46.00 to 47.00
Chicago	52.00 to 54.00
Birmingham	48.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Samuel Uris Iron Works, Inc., Edgewater road and Seneca avenue, Brooklyn, has filed a schedule in bankruptcy, showing liabilities of $69,411 and assets of $39,709.

Wheeling Steel Corp. To Operate Subsidiaries

The Wheeling Steel Corp. on May 1 assumed active operation of its three subsidiaries La Belle Iron Works, Stuebenville, O., Whittaker-Glessner Co., with plants at Portsmouth, O., Wheeling, W. Va., and elsewhere and Wheeling Steel & Iron Co., Wheeling. The corporation has been in the role of a holding company since the consolidation of the interests three years ago, and each of the companies has been operating under its own name. The annual report of the corporation, submitted to stockholders by Chairman Alexander Glass and President I. M. Scott, shows earnings of $4,252,777 for 1922 after maintenance charges and other deductions. This compares with $1,514,805 one year before. Net profits amounted to $457,845 against a deficit of $2,794,853 in 1921. After payment of dividends of $1,180,860 last year there was a deficit of $723,021 against a deficit, after dividends in 1921, of $5,249,077. The volume of business done by the corporation, exclusive of inter-company shipments, amounted to $47,926,052 in 1922. This was an increase of 69 per cent over the previous year's total of $28,300,995. The number of employes increased from 7609 in 1921 to 10,986 in 1922. Wages during the year totaled $17,158,856 against $11,985,165 in 1921.

Iron and Steel Situation in France Improving

Washington, May 1.—Commercial Attache Chester Lloyd Jones at Paris has summarized the present condition of the French iron and steel market in the following cable to the department of commerce:

"The iron and steel market here is stabilizing, and quotations of iron and steel products on a sliding scale of prices according to the price of coke at the time of delivery are disappearing, due to the fact that the Societe des Consommatours de Cokes de Hauts-Fourneaux has set a definite schedule of prices of coke to extend through May.

"It is now stated that 20 per cent of necessary coke supplies will be furnished blast furnaces at 198 francs per ton and further needs at 310 francs. While these prices are still very high, since iron producers are now given a definite cost price on which to base estimates a revival in metallurgical lines is expected to result. Supplies of coke from the Ruhr have slightly improved.

"The pig iron market is strong, with few producers quoting, but several blast furnaces recently have been blown in. Firm quotations on pig iron are being made at 500 francs, furnace. Prices on hematite pig are easier and sales are reported at 550 francs, furnace, with plants in central France quoting 530 francs.

"The steel market shows improvement, and manufacturers of semi-finished material are again in the market. Orders for structural shapes are being booked at 750 francs per metric ton, mill. The plate market is very active, with orders being placed in Belgium and England, and for sheets in England. Five millimeter plates are selling at 900 francs and merchant bars at 800. Mill prices are not profitable but makers accept them in order to keep their forces employed."

Highest Wages Are Being Paid in Detroit

Detroit, May 1.—With but one exception this city is paying higher wages for common labor than is paid in 50 of the largest manufacturing cities in the country, according to the Detroit Employers' association. The report shows that common labor in Detroit is paid 45 to 50 cents an hour, while in only one other city of the 50 from which reports have been received is the average more than 40 cents. The exception is Rochester, N. Y., where laborers are paid 55 cents.

Three cities, Memphis, Youngstown and Akron, O., pay a higher average wage for all around machinists, 85 cents, while the average here is 80 cents. In Flint, Mich., and in Pittsburgh the average also is 80 cents.

The weekly barometer issued by the association shows 226,829 men employed in 79 reporting factories, a gain of 1825 for the week. On this basis, association officials say, there are about 325,000 men employed in manufacturing plants in this city.

Ship Much Steel Furniture

Washington, May 1.—Steel furniture shipments in the month of March were the largest since October, 1920, according to figures received from the bureau of census in co-operation with the National Association of Steel Furniture Manufacturers. Except for the three months of August, September and October in 1920, the March shipments were the highest on record. Total shipments of steel furniture goods as reported by 22 manufacturers amounted to $1,709,206 in March, as compared with $1,307,173 in February and $1,087,228 in March, 1922.

Harvey Hubbell, Inc., Bridgeport, Conn., maker of electrical specialties and machine screws, has increased its capital stock from $300,000 to $2,000,000.

Metals at Peak, Says Harvester Head

Chicago, May 1.—The peak of the metal market has been reached, in the opinion of Alexander Legge, president of the International Harvester Co., who addressed members of the tractor and thresher department of the National Association of Farm Equipment Manufacturers at their spring meeting in Chicago April 20. He counseled against a repetition of the character of buying which obtained in 1920 when manufacturers entered the market and bid against each other for materials to fill orders that were to a large extent fictitious, and called attention to the fact that the present shortage of farm machinery may bring with it a duplication of orders which some may possibly mistake for real business unless a very careful and thorough investigation is made.

Production of steel during March, he said, reached a point never before equaled and he asserted that if the present rate of production continues, the supply of metal products should soon catch up with the demand and probably exceed it. This, he emphasized, is of the utmost importance to the farm equipment industry since a rise in material prices during the last year has constituted one of the greatest obstacles which the industry has been called upon to face.

"The implement line is pretty well sold out," he said. "The spring trade is much better than last year, and if it had not been for the runaway material market we would have reason to believe good trade conditions will remain for some time."

Touching upon the European situation, Mr. Legge asserted that "the prosperity of the farm equipment industry depended much upon the ability of the farmers to dispose of their surplus products abroad. If the situation abroad clears up, it will materially prolong the present prosperous period." He expressed little hope, however, that the European situation would rapidly improve.

He stated farmers are coming to realize that farm equipment is probably the lowest in price of any products which can be purchased at this time. He also stated modern equipment was needed.

Offers Railway Cars

Washington, May 1.—Sealed bids for the sale of railway equipment located at various points will be opened by the chief of engineers, war department, on May 8. The equipment includes 36 narrow gage flat cars, five dump cars, one track laying car and one narrow gage saddle tank locomotive.

April Tool Demand Slumps Off

Volume of Buying Below That of Preceding Month—Single Tool Orders Still the Rule—Large Railroad Business Is in Prospect—Crane Orders and Inquiries Are Heavier—Labor Shortage Aids Demand

BUYING of machine tools and general shop equipment during April was not up to expectations. Total orders were below those of the preceding month and action was postponed on a number of projects which were expected to develop into business during the month. Orders, were fairly numerous although for the most part they were for single units. Demand from the automotive industry and the railroads showed a noticeable falling off and it is thought this slump is due to the fact these interests have completed their spring buying programs and will remain out of the market for some time. However, with continued high production of automobiles it is obvious the machinery needs of the industry are far from filled. The same is true of the railroads.

Advances in Prices Still Noted

PRICE advances were noted from time to time throughout the month. However, they were not general and it is the general belief throughout the trade that prices now will remain stationary for some time. Some dealers are of the opinion the higher prices being quoted have choked off some of the business which had been pending, but this thought is not general. In view of ever-rising production costs machine tool builders have been forced to advance their quotations.

Large Railroad Purchases Lacking

DESPITE the fact large railroad buying was absent during the month a considerable amount of business was placed by these interests. Railroad buyers included the Wabash, the Southern, the New York Central, the Pennsylvania, the Illinois Central, Atchison, Topeka & Santa Fe, Missouri, Kansas & Texas, Union Tank Car Corp., Maine Central, Portland Terminal, Indiana Harbor Belt, Norfolk & Western, Canadian National and the Canadian Pacific railroads.

Prospective Railroad Demand Large

BUSINESS in prospect from the railroads continues outstanding. Practically every railroad in the country is working on improvement and expansion programs and without exception these interests are inquiring in the machinery and equipment market for either large or small amounts of equipment. Prospective railroad buyers of size include the Chicago & Northwestern, the Chicago, Burlington & Quincy, the Rutland, the Rock Island, Central Railroad of New Jersey and the Santa Fe.

Single Tool Purchases Rule

GENERAL industrial buying during the month was of the same character as during March. Single tool purchases represented the bulk of demand although the volume of business done was fairly satisfactory. The decline in automotive demand, however, was severely felt by some tool manufacturers. The Ford Motor Co., Detroit, continues an active buyer, for although it has purchased a quantity of machinery within the past few weeks, its total machinery needs are in excess of $500,000. Other automobile builders in the Detroit and Cleveland district are planning expansions, which will develop an outlet for considerable machinery, and one Cleveland builder, the Stearns Co. has within recent weeks closed on a large amount of equipment to be used in building a new type of car it plans to place on the market. All of this latter company's purchases have not yet been made, it is understood. Other general industrial buyers of size include the General Electric Co., Schenectady, N. Y., the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., the American Locomotive Co. and several others.

Turning to Secondhand Machinery

WITH the inauguration of higher prices for new tools machinery users have again reverted to the used machinery market and activity in this field has shown a decided revival. Within the past few months users have shown more interest in new machinery than they have for some time. This was due to the fact used machinery had become harder to obtain and with plant operations steadily increasing, buyers were more in a mood to consider new tools. However, with higher prices being named on the new machinery many prospective buyers continue to follow closely the used machinery and as consequence every auction and sale of surplus and liquidated equipment is well attended.

Many Liquidation Sales Held

INDICATIVE of the large turnover in capital involved in the many machinery auctions being held is that of the sale of the plant of the American & British Mfg. Corp., Providence, R. I. This plant was purchased by the Franklin Machine Co. at public auction April 10 at a cost of $268,000. The 285 lots of machinery and equipment were sold separately, the total amount obtained from the sale of the entire assets being $303,759. The Bridgeport, Conn., plant of this same corporation was sold at auction late in March and was disposed of at $183,250. The Empire Machinery Exchange Co., Cleveland, has obtained the exclusive sale of the machinery and equipment of a Cleveland automotive parts maker. The machinery in this plants is valued at more than $480,000. The Industrial Plants Corp., New York, has been engaged to liquidate the equipment of the Oscar Daniels Ship Yards at Tampa, Fla.

Crane Equipment Demand Heavy

CRANE and allied equipment demand is the best it has been since 1920. The return of general prosperity has resulted in the development of many projects which had been temporarily abandoned. New foundries and industrial structures of all kinds are being erected, which is resulting in orders for hoists, cranes, etc. Another factor, is that of labor shortage. Confronted with a scarcity of manual labor, manufacturers are being compelled to turn more and more to labor saving equipment, which is closely allied to cranes and hoists. Both the steel industry and the railroads are placing orders for considerable heavy equipment, and inquiries in the market and in prospect from industry in general, indicates a strong demand for some time to come. Crane and hoist prices are stiffening.

Equipment Demand Is Gaining

Volume of Orders Being Placed Is Larger—Railroad Demand in Prospect Is Enormous —Many New Projects Developing—Secondhand Machinery Is Being Rapidly Absorbed—Locomotive Crane Deliveries Being Deferred

INCREASING activity is noted in the demand for machine tools and shop equipment. While the market is not particularly brisk the order volume is larger than a week ago and prospective business continues to gain in size as metalworking shop operators endeavor to enlarge their production programs. More railroad business continues to be placed. The Illinois Central has closed on approximately $125,000 of equipment. Other railroad buyers of the week included the New York Central, the New York, Ontario & Western, the Escanaba & Lake Superior, the Wabash, the Chicago & Great Western, the St. Louis-San Francisco and several others. Prospective railroad buyers include the Chesapeake & Ohio, the Canadian Pacific, the Canadian National, the Chicago & Northwestern, the Santa Fe, the Elgin, Joliet & Eastern and the Denver & Rio Grande Western railroads. All of these roads have large improvement programs under consideration which they are expected to undertake actively in the near future.

While the automobile industry is not as active as a buyer as it has been in the past few months, a considerable amount of business still is coming out from this industry. The Ford Motor Co. continues to buy heavily, while the Studebaker Corp. has been a recent purchaser. General industrial demand is improving but orders are scattered and come from diversified lines of manufacture. Most of this business is in single tools, but many larger orders are being placed.

Secondhand machinery appears to be favored by the majority of buyers, although due to the fact used tools of quality are scarce, much of this business is being turned into new tool channels. Auction sales are well attended. Machine tool prices appear to have reached a common level as but few new prices have been noted during the week. However, due to the constantly rising production programs it is a question whether they will long remain at the present level.

Orders for cranes are numerous and current demand for this class of equipment is the best experienced in some time. Some locomotive crane builders report the past two months' demand has been the largest in the history of their companies and deliveries are being deferred from two to three months and beyond. Some fair crane business was done during the week just past sellers generally report.

Prospective Machinery Orders Continue Large

NEW YORK, May 1.—The machine tool market here starts off the new month with fairly substantial lists in sight, but with little assurance that they will develop into business in the near future. One of the larger lists contemplated and one which some time ago was reported as scheduled to be brought out in May, is that of the Chesapeake & Ohio railroad, which some sellers believe will be the biggest that road has ever issued; however, nothing definite has yet materialized.

Current buying continues to be confined largely to orders for one and two machines. The General Electric Co., Schenectady, N. Y., again has closed on several items, but it is among the few outstanding buyers. The month just closed was the least active in this district so far this year.

An outstanding order of the week calls for 10 engine lathes for the New York Central railroad. The New York, Ontario & Western also has been a good buyer, closing on at least 10 miscellaneous machine tools. Included in other business is a 1500-pound hammer for the Escanaba & Lake Superior railroad; a car wheel borer and a locomotive journal truing lathe for the Wabash railroad; 600-ton driving wheel press for the St. Louis & San Francisco; a car wheel borer for the Manchester Street railway, Manchester, N. H.; two car box borers, for the Magnus Co., one being for installation at its Depew, N. Y., plant and the other at New Haven; a car wheel borer for the Chicago & Great Western railroad; and a 2500-pound hammer for A. Guthrie & Co. The New York Central railroad has brought out an inquiry for a 14 x 18-inch lathe.

From the standpoint of cranes, however, business has been good. Sellers of locomotive cranes in some instances report the past two months as among the best in the history of their companies, with deliveries being deferred from two to three months and later. A feature of the past week has been some substantial foundry buying of overhead cranes. Prices on virtually all types of conveying equipment continue to show strength.

Trading in foundry equipment is active despite a slight slowing up, due to the annual meeting and exhibit of the American Foundrymen's association now being held in Cleveland. Several sizable orders have been placed with others on the point of being awarded. The H. B. Smith Co., Westfield, Mass., is understood to be closing on a considerable list of miscellaneous equipment and another Massachusetts foundry is on the point of doing so.

Other buyers include the Utica Heater Co., Utica, N. Y., and Pierce, Butler & Pierce, New York city, both buying large cupolas from the Whiting Corp. The cupola for the latter company is for installation at its plant in Zanesville, O. The Westinghouse Electric & Mfg. Co., recently brought out a list of eight cranes, of which possibly two were alternates, for a contemplated foundry addition at its South Philadelphia works. Later, however, this inquiry was at least tem-

porarily withdrawn. The list included one 60-ton, 6-motor double trolley crane, 100-foot span with auxiliaries; two 60-ton, 7-motor cranes, with two 30-ton trolleys and two 10-ton auxiliaries; one 20-ton, 4-motor crane, 5-ton auxiliary, and 47-foot span; and three 10-ton, 4-motor cranes, 70-foot span and 5-ton auxiliary. The American Car & Foundry Co. has recently closed on two 5-ton electric overhead cranes to the Pawling & Harnischfeger Co.

Included in projects contemplated is a foundry extension for the Colonial Brass Works, New Britain, Conn.; a 1-story foundry addition for the Rockwood Stove Works, Rockwood, Tenn., and a foundry for the Connecticut Brass Foundry, Waterbury, Conn. An unusual demand prevails for sand cutters.

Larger Sales Are Reported

CLEVELAND, May 1.—Considerable improvement in demand for machine tools and general shop equipment, is reported by dealers in this district as contrasted with a week ago. While single unit orders still are in the majority more business involving a number of tools is reported and the volume of sales is considerably larger. However, most of the business appears to be going to the secondhand tool dealer, although new machine tools are in greater demand than they have been for some months past. While it is true the current machinery buyer is a bargain seeker and is taking secondhand machinery whenever available, due to the fact good used equipment is scarce many orders are being turned into new tool channels. Higher prices being quoted on new tools is thought by some sellers to have choked off some buying, but in view of the constantly rising production costs, it is not unlikely tool prices will go still higher. Consequently it is thought many of those buyers who have been scared out of the market by the prices will enter it again shortly.

Indicative of the increasing demand is the report of a local machinery dealer. This interest disposed of two boring mills and three shapers to a New York state user. A local user bought two milling machines and a boring mill. Another Cleveland buyer, engaged in structural steel fabricating, took a 24-inch shaper. Still another Cleveland user purchased a milling machine, while an automobile builder placed an order for four turret lathes, two milling machines, two drills and one special drill. Another local machinery house received an order from the Western Automatic Screw Products Co., Elyria, O., for eight automatics, and still another dealer reported disposing of practically all the equipment, including 26 machine tools, located at the plant of the Cleveland Specialty Machine Co. This equipment was disposed of among a number of users.

Inquiries are heavy, and include one for 16 tools, another for nine machines and still another for 23 turret lathes. Practically all the large lists current are from interests in other districts. However, many single tool iun qriies cmfwyp the market from local users. A local dealer expects to close on order within the next few days on two large lathes, the prospective buyer having inspected the machines and practically closed the sale.

Sales Still Hold Off

BOSTON, May 1.—While new England manufacturers of machine tools continue to increase production, the demand for the products of these manufacturers shows a slight improvement. Actual trading among New England dealers has been quiet during the past week. Several sizable auction sales in this territory recently have placed an unusually large amount of equipment on the market and dealing in used machinery generally continues fair. New tool dealers find encouragement in the striking demand for electric motors for tool purposes which has recently developed. One manufacturer of electric equipment which is used largely in connection with machine tools is behind on orders and working 24 hours a day. The price tendency still is upward although no formal advances have been recently announced. Some drill and grinder manufacturers have marked up prices to meet advances in these lines made by other manufacturers a week or ten days ago. The threatening laboring difficulties in tex-

Crane Awards and Inquiries of the Week

Orders Placed

One 25-ton handpower crane to General Electric Co., Buffalo; one 60-ton electric and one 10-ton handpower to Phoenix Utilities Co., New York; one 20-ton handpower to the West Indies Sugar Finance Corp., New York, for export; one 15-ton electric to Union Pacific railroad, Omaha; two 4-jack locomotive hoists of 200-tons capacity each to the Atlantic Coast line, Wilmington, N. C.; one 60-ton electric to Witherbee, Sherman & Co., Port Henry, N. Y.; one 50-ton transfer table to the Midwest Engine Corp., Indianapolis; all by the Whiting Corp., Harvey, Ill.

One 5-ton double legged gantry crane with 50-foot span for the Central Steel Co., Massillon, O., to the Alliance Machine Co., Alliance, O.

One 40-ton trolley for the National Tube Co. to the Alliance Machine Co.

One 50-ton crane with 65-foot span for the General Electric Co., Schenectady, N. Y., to the Alliance Machine Co.

One 25-ton crane with 80-foot 4-inches span, for the Bethlehem Steel Co., Bethlehem, Pa., to the Alliance Machine Co.

One 150-ton low type stripper with 40-foot span and one 5-ton low type soaking pit crane with 70-foot span for the International Harvester Co., Chicago, to the Alliance Machine Co.

One 3-motor electric traveling crane for foundry service, 5-tons capacity and with 55-foot span for the Sanford-Riley Stoker Co., Detroit, to the Northern Engineering Works, Detroit.

One 4-motor electric traveling crane, 60-tons capacity with 10-ton auxiliary 60-foot span, for the Utah Copper Co., New York, to the Northern Engineering Works.

One 2-motor electric traveling crane with 22-foot span for the University of Michigan, Ann Arbor, Mich., to the Northern Engineering Works.

One 10-ton 3-motor electric traveling crane for the General Electric Co., Schenectady, N. Y., to the Northern Engineering Works.

One 3-ton crane with special bucket trolley for the West Penn Power Co., Connellsville, Pa., to the Barber-Foster Engineering Co., Cleveland.

One 10-ton, 2-cage crane with 72-foot, 2-inch span for Zanesville, O., plant of Pittsburgh Plate Glass Co., to the Alliance Machine Co., Alliance, O.

Seven 10-ton electric traveling cranes, with spans ranging from 51 to 95 feet, for the Hunt-Spiller Mfg. Co., Boston, to the Whiting Corp., Harvey, Ill.

Two electric traveling cranes, one 60-ton and one 35-ton for the Brooklyn Edison Co., New York, to the Whiting Corp.

One 60-ton 4-motor and one 10-ton handpower cranes for the Phoenix Utility Co. to the Whiting Corp.

Three 25-ton locomotive cranes for the Southern Pacific railroad, one each to the Industrial Works, Bay City, Mich., McMyler-Interstate Co., Bedford, O., and the Brown Hoisting Machinery Co., Cleveland.

Three 20-ton cranes for Stuart & Co., Newton Falls, Mass., to the Browning Co., Cleveland.

One 15-ton crane for the U. S. Rubber Co., Passaic, N. J., to an unknown builder.

One 30-ton crane for the Kelly Island Lime & Transport Co., Sandusky, O., to the McMyler-Interstate Co.

One 15-ton locomotive crane for the Brooklyn Edison Co., to the Ohio Locomotive Crane Co., Bucyrus, O.

Two 2½-ton electric traveling cranes with 26-foot spans for the Congolium Co., Philadelphia, to an eastern builder.

One catapillar crane for the Pittsburgh Bolt & Machine Co., Pittsburgh, Kans., to unknown builder.

One 25-ton used Industrial crane for the Florence Pipe Foundry & Machine Co., Florence, N. J., to unknown seller.

One 20-ton used Link-Belt crane for the Consolidated Light & Power Co., Baltimore, to an unknown seller.

Orders Pending

One 10-ton, 3-motor floor-controlled crane with 39-foot 8-inch span for filtration plant in Wheeling, W. Va.; bids being considered; Pittsburgh dealer representing Bedford Foundry & Machine Co., Bedford, Ind., reported low bidder.

One 75, one 40, one 15 and three 10-ton cranes for the Metal & Thermit Corp., South San Francisco, Cal.; bids to be opened at Pittsburgh office of company.

One 5-ton crane for a steel company in the Pittsburgh district; bids being taken.

One 25-ton electric traveling crane for the Riverside pumping plant in Milwaukee; bids to be taken until May 10. J. W. Nicholson is city purchasing agent.

Two 20-ton electric traveling cranes with three motors, and three 10-ton traveling cranes with hoisting apparatus and trolley motor operated, and bridge hand operated, for the Milwaukee sewerage commission for the Jones Island sewage disposal plant; submitted bids rejected and new bids taken until May 4.

tile mills have now been adjusted and this leaves the way clear for an exceedingly heavy production which offers one of the best potential markets in New England for machine tools.

More Activity Is Shown

PITTSBURGH, May 1.—While not brisk, the machine tool and equipment market is more active than it has been for some weeks past and the numerous inquiries coming out forecast good demand for some time to come. One Pittsburgh seller reports having disposed of a large squaring shear to a sheet metal concern, as well as small tools, drills, grinders, lathes, etc. An inquiry has been received by another dealer here from a Youngstown, O., interest covering a general list of 6 or 8 machine tools. All makers report the disposal of single tools and one dealer has closed on some special machinery involving straightening machines, presses, steam hammers, etc.

Demand for secondhand machinery is active, one interest shipping a 2000-pound forging hammer to Los Angeles the past week, and it also disposed of numerous small single tools locally, including shears, radial drills, as well as 10 milling machines to the Middlewest. Another used machinery dealer this week sold a punch and other machinery such as bench lathes and a press. Special lathes, woodworking equipment, etc., also were involved in recent transactions.

Crane awards this week have not been numerous and the number of inquiries recently current apparently are held in abeyance. One placed this week called for a 10-ton, 2-cage crane with 72-foot 2-inch span for the Zanesville, O., plant of the Pittsburgh Plate Glass Co., going to the Alliance Machine Co., Alliance, O. The 10-ton floor-controlled crane for the Wheeling, W. Va., filtration plant, on which bids closed some few weeks ago, is reported to be still held in abeyance. A dealer in the Pittsburgh district is said to be low bidder on this crane, which also is negotiating for a 20-ton crane for nearby shipment. The Urick Foundry Co., Erie, Pa., recently asked for prices on two 3-motor electric traveling cranes with 27-foot spans. Various foundry operations continue to manifest interest in the crane market from time to time.

Foundry equipment demand is on an exceedingly high plane, numerous inquiries being out from all sections of the country and a number of purchases likewise being made. The United Steel & Car Co., Martinsburg, W. Va., is a possible purchaser of foundry equipment as well as machine tools in this district, having taken an option on a plant site in the Martinsburg territory.

Betterment in Demand Is Noted

CHICAGO, May 1.—Owing to the purchase of approximately $125,000 of machine tools by the Illinois Central railroad during the last week of the month, April sales of local dealers will closely approximate those for March. This is the second time the Illinois Central has bought within 30 days, its previous purchase having amounted to fully $150,000. Recent inquiries from the Santa Fe, involving 75 tools and from the Chicago & North Western, totaling 50 machines, together with a pending list from the Elgin, Joliet & Eastern, have raised the hopes of sellers for an active demand in May. The Denver & Rio Grande Western railroad is also expected to enter the market for tools required for a shop which it will build at Denver. Orders from miscellaneous sources continue to drag, although they appear to be in somewhat better volume than a week ago. Individual purchases generally are confined to one or two tools bought to fill out present machine shop facilities. The Studebaker Corp., South Bend, Ind., has closed on two 20-inch shapers. The city of Chicago will receive tenders today on a 3-foot triple purpose plain radial drill arranged for motor drive and a 20-inch x 12-foot high duty engine lathe arranged for belt drive. Outside of an advance of about 10 per cent by a western hack saw manufacturer, no further price changes have been made and none appear to be in contemplation, although machine tool manufacturers are frankly concerned about labor costs, the scarcity of high class mechanics being pronounced.

Outlook Continues To Encourage

MILWAUKEE, May 1.—Notwithstanding the fact the past five or six months have produced the best machine tool business in more than two years, the outlook for new business is regarded as equally as bright, if not more so. There was a slowing up of orders about the middle of April, but there has since been a decided recovery, with new enterprises coming out almost every day to make a constant market. Aside from several big projects of the Ford interests there is coming before makers and dealers a relatively large need of a diversified character for improvements in the large Ford woodworking and chemical plant at Iron Mountain, Mich. The Chicago & Northwestern railroad is about to build a $500,000 roundhouse and service plant at Madison, Wis. The city of Milwaukee is in the market for a 25-ton electric crane for the new Riverside pumping plant, and the municipal sewerage commission is taking new bids on five cranes for the Jones Island disposal plant. Foundries are generally busy at capacity and the general machine shop trade is being offered more work than it can comfortably handle.

Order Volume Is Steady

TORONTO, Ont., May 1.—While business in the machine tool market is not as active as a month ago, a steady volume of orders continue to be placed. Individual buying is steady, but large lists are absent. Despite the fact the Canadian National railways has spent upward of $500,000 on equipment for car shops so far this year, it is reported additional expenditures will be necessary. The Canadian Pacific railway is said to be contemplating spending about $7,000,000 on new equipment for its shops. Charles Murphy, western manager of the latter road, now is in Vancouver, B. C., with regard to the erection of new shops to cost $100,000 to replace those recently damaged by fire. The new shops will be equipped with the latest machinery and tools. The automotive industry continues to show interest in the equipment market. The Ford Motor Co. of Canada, has spent $250,000 on equipment for a plant at Ford, Ont., and will be in the market for additional machinery. Manufacturing companies in general are showing interest in labor and time saving equipment.

Pulp and paper companies continue to be a factor in the market and some extensive buying for new works and additions has recently been reported. Several large undertakings have yet to be started in eastern Canada and in Manitoba and British Columbia for which large sums will be spent on equipment.

The board of control, Ottawa, Ont., A. F. McCallum, commissioner of works, will purchase electrical equipment and apparatus. The Green River Bottling Co., William street, London, Ont., will build a factory and purchase equipment. J. R. Booth, Ltd., Booth street, Ottawa, Ont., will erect a turbine building. The public utilities board, Catham, Ont., B. L. Bedford, chairman, will purchase a 1500 kilowatt transformer. H. J. Jones & Sons, Dundas street, London, Ont., will purchase equipment for a box factory. R. Frenette, 320 Eighth avenue, Montreal, Que., will purchase equipment for a garage and auto repair shop. I. Lewis, 804 Lewis building, 17 St. John street, Montreal, Que., is asking for a medium size power punch. The Granby Clay Products Ltd., Granby, Que., will purchase equipment for brick making. M. Meloche, 2218 Jeanne Mance street, Montreal, Que., is asking for equipment for blacksmith and machine shops.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

ALTON, ILL.—The Schuessler Foundry Co. has started the construction of a foundry building.

AURORA, ILL.—The Richsto Mfg. Co., recently incorporated with $35,000 capital stock, will manufacture steel building supplies, including such specialties as metal bases, chair rail, window and door casings, window stools, picture molding, corner beads, etc. Negotiations are now in progress for plant space. Officers are C. H. Richards, president and treasurer; Oscar Yasche, vice president; and J. H. Stoltz, secretary.

CHICAGO—The Commercial Machine & Mfg., Co, has increased its capital stock from $40,000 to $200,000.

CHICAGO—W. G. Garvey, 4916 Bloomingdale avenue, has let a contract for a 1-story foundry, 63 x 73 feet, at that address, to cost $6600.

CHICAGO—Bud Williams, 2902 Armitage avenue, plans the erection of a machine shop addition, 1-story, 50 x 77 feet to cost about $14,000.

CHICAGO—The Link-Belt Co., 910 South Michigan avenue, plans the erection of a 1-story machine shop, 125 x 175 feet to cost about $85,000.

CHICAGO—F. H. Noble Co., 555 West Fifty-ninth street, has awarded a contract for the erection of a factory building to cost about $125,000.

CHICAGO—The Devry Corp., 1248 Marianna avenue, has awarded a contract for the erection of a 2-story factory building, 100 x 120 feet to cost about $42,000.

CHICAGO—The Brunswick-Kroeschell Co. 46 West Erie street, will start work soon on the erection of a 5-unit plant to cost about $500,000.

CHICAGO—The Electric Rotary Machine Co., 40 South Clinton street, has purchased a 2-story plant comprising 15,000 square feet of floor space at 3825-31 West Lake street.

CHICAGO—H. D. Curtis, 1119-23 West Jackson boulevard, is taking bids through F. M. Barton, 3426 South Kedzie avenue, on a 2 and 6-story addition, 56 x 106 feet, to an electric fixture factory, to cost $225,000.

CHICAGO—F. H. Noble & Co., 535 West Fifty-ninth street, manufacturer of advertising specialties, has let a contract for a 2-story plant, 96 x 124 feet, 535-545 West Fifty-ninth street, to cost $85,000.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.615c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.85c
New York	3.54c
Philadelphia	3.55c
San Francisco	4.00c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.615c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.715c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.95c
New York	3.64c
Philadelphia	3.65c
San Francisco	4.10c
Seattle	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.715c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.30c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.90c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.00c
Seattle	5.25c
St. Louis	4.25c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.75c
Buffalo	5.10c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.75c
Detroit	5.05c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	6.30c
Seattle	6.10c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.90c
Buffalo	6.10c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.90c
Detroit	6.05c
Los Angeles	7.30c
New York	6.15c
Philadelphia	6.25c
San Francisco	7.15c
Seattle	7.10c
St. Louis	6.10c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.60c
New York	4.39c
Philadelphia	4.35c
San Francisco	4.75c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.50c
Boston (shapes)	5.00c
Buffalo (rounds)	4.45c
Buffalo (shapes)	4.95c
Chicago (rounds)	4.30c
Chicago (shapes)	4.80c
Cincinnati (rounds)	4.25c
Cincinnati (shapes)	5.75c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.30c
Detroit (shapes)	4.80c
Los Angeles (rounds)	5.40c
New York (rounds)	4.40c
New York (shapes)	4.90c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.75c
St. Paul (rounds)	4.55c

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

CHICAGO—The Erie Can Co., 816 West Erie street, has been incorporated with $10,000 capital stock by Frank N. Sanders, August Pettelkow and Frank M. Course. The company is represented by Judah, Willar, Wolf & Reichman, Corn Exchange Bank building.

CHICAGO—The Pure Air Ventilating Co. 1340 Roscoe street, has been incorporated with $3000 capital stock to manufacture and install ventilating systems, by E. A. Pinkerton, E. K. Anderson and M. O. Pinkerton. The company is represented by E. A. Pinkerton, 1340 Roscoe street.

CHICAGO—The United Auto Device Co., 29 North Wells street, has been incorporated with $15,000 capital stock to manufacture and deal in automobile accessories, etc., by Abe N. Lustig, Max Sternberg and Jack M. Eisenberg. The company is represented by Lustig & Hershenson, 127 North Dearborn street.

Chicago—The Specialty Mfg. Co., 132 South Jefferson street, has been incorporated with $25,000 capital stock to manufacture and deal in machinery, etc., by James A. Duckett, David Levinson and Louis Neumann. The company is represented by Berkson, Lautman & Levinson, Chicago Stock Exchange building.

CHICAGO—The Sapihl Grinder Co. 504 Monadnock block, has been incorporated with $20,000 capital stock to manufacture and deal in machinery, etc., by Karl A Pihl, Charles J. Anderson and Floral Anderson. The company is represented by Alvin E. Stein, 414 West Monroe street.

CHICAGO—The Kapitol Lamp Mfg. Co., Inc., 1442 South Michigan avenue, has been incorporated with $40,000 capital stock to manufacture and deal in lamps fixtures, etc., by Anita Sloan, Myer H. Gladstone, and Julian H. Luster. The compny is represented by Lazar H. Gladstone, 1031, 127 North Dearborn street.

MOLINE, ILL.—The Frank Foundries Corp. has started the construction of a plant addition to cost $20,000.

AUBURN, IND.—The Elcar Motor Corp. contemplates the erection of a plant building.

EAST CHICAGO, Ind.—The United States Foundries & Mfg. Co. has been incorporated with $50,000 capital stock. Incorporation was under the laws of Delaware and incorporators named were James E. Nellis, Dollie R. Sambursky and Alexander Vitkus. The company is represented by the Delaware Registration Trust Co.

ELKHART, IND.—The Auto Specialty Co. will construct a plant addition to cost $12,000.

LAPORTE, Ind.,—The Lincoln Foundry Co. has been incorporated with $25,000 capital stock to operate a foundry and machine shop. Directors of the company are Andrew H. Rolinson, Thomas F, Lewis, A. Frank Golick and Ben C. Rees.

LIBERTY, IND.—Loren Kennedy, J. F. Rude and J. E. Roughan have organized a company to erect a foundry here. The foundry will be located near the plant of the Rude Mfg. Co.

MARION, IND.—The Indiana Mfg. & Electric Co., recently organized, will manufacture electric supplies of various kinds, having taken possession of the former plant of the Globe Stove Co. at Twelfth and Race streets.

LOUISVILLE, KY.—The Standard Sanitary Mfg. Co. 628 South Shipp street, plans the erection of a 1-story foundry addition.

DETROIT—Roehm & Davison, 6450 Mack avenue, plans the erection of a building, 2-stories, to cost about $100,000.

MONROE, MICH.—The Monroe Electric Railway & Equipment Co. contemplates the erection of a factory building.

MUSKEGON, MICH.—The heat treating department of the Continental Motors Co. plant here was destroyed by fire.

BALTIMORE—The Porcelain Enameling & Mfg. Co. is having plans drawn for the erection of a 1-story factory building. It also plans to erect a 2-story warehouse.

ALBANY, N. Y.—The Brockway Truck Co., 1260 Broadway, plans the erection of a factory addition to cost about $20,000.

BINGHAMTON, N. Y.—The Larrabee Deye Motor Truck Corp., 23 Washington street, contemplates the erection of a factory building to be erected at an estimated cost of $200,000.

BROOKLYN, N. Y.—The Mapleton Roofing & Tinsmith Co. has been incorporated with $5000 capital stock by I. and G. Goldstein and J. Frankel. The company is represented by S. Sverdlik, 280 Broadway.

LOCKPORT, N. Y.—The Electro Metal Radiator Corp. contemplates the erection of a factory building.

NEW YORK—The Union Wire Die Corp. has increased its capital stock from $10,000 to $50,000.

NEW YORK—The Otis Elevator Co., according to W. D. Baldwin, chairman, will undertake shortly additions to its Quincy, Ill., and Yonkers, N. Y., plants.

NEW YORK—The Continental Machinery Corp. has been incorporated with $5000 capital stock by S. B. Schwartz, A. I. Stern and F. Kron. The company is represented by Jasie & Solomon, 20 Vesey street.

NEW YORK—The Mechano Chemical Development Co., chemical machines, has been incorporated with $5000 capital stock by W. J. Wyte, E. P. Meeker and M. A. Klein. The company is represented by C. E. Dunbar, 233 Broadway.

POUGHKEEPSIE, N. Y.—The George Sague Mfg. Corp. has been incorporated to make machinery with $50,000 capital stock by G. Sague, H. Gardner and F. G. C. Miller. The company is represented by F. S. Quintero, attorney.

BURNSVILLE, N. C.—The Burnsville Chair Mfg. Co. has been organized with $1,000,000 capital to establish a plant here. William J. Parnelli is one of the incorporators.

CHARLOTTE, N. C.—The T. L. Talbert Iron & Steel Co. has been incorporated with $100,000 capital stock by T. L. R. Talbert, M. W. Hood and Ida Cannon.

HIGH POINT, N. C.—A large plant for the manufacture of panels will be erected here by the Revolution Veneer & Panel Co.

CLEVELAND—The Osborn Piston Ring Co. has been incorporated with $500 capital stock by William A. McAfee, East Ohio Gas building, C. A. Niman, W. T. Holliday, Maurice F. Hanning and Leonard Smith.

SPRINGFIELD, O.—The Mitren Metal

Industrial Business Changes Recently Announced

THE Bridgeport Brass Co., has removed its New York offices from the Woolworth building to the Pershing Square building on Park avenue. F. Morton Clark has been appointed to succeed Arthur J. Nelson as district sales manager. Mr. Nelson has been made sales manager of the fabricating division of the company with headquarters at Bridgeport, Conn.

* * *

Brunner Service Co. has moved from 438 West 164th street to larger quarters at 441 East 123rd street, New York city.

* * *

Alan Wood Iron & Steel Co., Philadelphia, has appointed Park & Williams, Inc., Real Estate Trust building, Philadelphia, as its selling agent for Swede pig iron in the New England territory, effective May 1.

* * *

Cyril J. Bath & Co., machinery dealers, have moved their offices from 1603 to 1738 St. Clair avenue, Cleveland, where its offices and warehouse now is under one roof.

* * *

S. P. Wright & Co., district representative for the Conveyors Corp. of America, 326 West Madison street, Chicago, has moved its offices from 109 East Broadway, Butte, Mont., to 812 East Iron street, that city.

* * *

A. L. Seaman & Co., 549 West Washington boulevard, Chicago, has been appointed sales representative in the Chicago territory for the Wolverine Tube Co., Detroit, manufacturer of seamless brass, bronze, and copper tubing.

* * *

Messrs. C. P. Sandberg have announced that since April 16 their New York address has been 100 Broadway.

* * *

The Iroquois Steel Co., Inc., Fulton, N. Y., has established the following sales offices: 885 Ellicott Square, Buffalo, in charge of F. G. Davis; 1360 West Third street, Cleveland, Tappenden & Gans; 303 Scherer building, Detroit, in charge of S. M. Wetmore; 296 Broadway, New York, in charge of William L. Buck; Liberty building, Philadelphia, in charge of A. B. Miles.

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912.	729,000	405,000	192,000	184,800
Monthly average 1913.	855,000	427,000	203,800	209,000
Monthly average 1919.	617,000	198,000	20,600	50,000
Monthly average 1920.	669,500	281,700	92,700	58,000
Monthly average 1921.	217,600	280,300	71,800	79,600
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	505,500	169,600	151,300
December	533,700	506,200	157,900	156,700
1923				
January	567,900	.....	157,800	139,500

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912.	566,000	363,000	206,000	79,400
Monthly average 1913.	639,000	385,000	202,300	109,000
Monthly average 1919.	658,000	179,000	27,400	32,000
Monthly average 1920.	755,600	250,200	101,300	49,000
Monthly average 1921.	302,100	254,500	65,000	62,300
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,201	423,000	179,600	136,800
November	600,800	404,100	174,600	130,200
December	546,100	408,100	166,700	131,600
1923				
January	634,100	.....	159,800	121,500

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	166,400	16,400	87,000	27,300
Average monthly 1913.	185,900	12,900	68,900	25,000
Average monthly 1919.	42,400	113,100	44,400	.....
Average monthly 1920.	92,400	89,000	67,000	26,200
Average monthly 1921.	137,100	38,500	43,300	.....
1922				
January	88,700	36,600		68,200
February	64,600	55,800	139,000	66,900
March	63,800	67,300		105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	62,400	154,300
June	52,800	73,200		137,700
July	55,900	54,800		182,900
August	80,100	40,300	129,700	181,800
September	70,600	50,000		175,000
October	90,600	109,200		233,800
November	79,800	58,500	140,000	186,700
December	114,000	.....		.....
1923				
January	128,900	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	400,600	41,500	124,500	482,400
Average monthly 1913.	414,100	48,200	128,800	516,900
Average monthly 1919.	186,100	19,400	14,500	.....
Average monthly 1920.	270,900	74,600	74,300	143,600
Average monthly 1921.	141,700	132,700	75,900	176,000
1922				
January	235,300	164,000		218,200
February	223,400	107,000	198,400	170,000
March	295,800	72,300		208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	279,600	204,500
June	236,300	180,300		209,132
July	251,700	182,100		206,200
August	270,000	168,400	522,600	181,300
September	279,200	174,000		223,500
October	347,100	235,600		229,908
November	372,300	181,300	631,200	210,000
December	114,000	.....	.....	.....
1923				
January	353,400	.....	.....	.....

Note—Belgian figures include Luxemburg since June 1, 1922.

*Provisional estimate. Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1923		
January	.....	134,441
1922		
December	96,358	154,087
November	152,250	124,004
October	184,202	131,542
September	76,393	128,370
August	49,054	144,264
July	62,426	157,027
June	39,154	216,298
May	23,098	229,616
April	18,720	197,562
March	12,774	206,474
February	11,535	133,333
January	13,404	155,962
Total	643,010	1,988,539
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	13,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
1919	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Products Co. has been incorporated with $10,000 capital stock by R. C. Schuster, R. C. Reynolds, O. F. Mitchell, O. S. Mitchell and C. C. Mitchell.

CONNELLSVILLE, PA.—The Connellsville Iron Works contemplates the erection of a 1-story factory addition, 110 x 125 feet to cost about $20,000.

PHILADELPHIA—The Apex Machine Co. has completed plans for the erection of a factory building. Ballinger & Co. are the engineers.

PITTSBURGH—The Mine Safety Appliance Co. 909 Chamber of Commerce building, plans the erection of a factory building.

READING, PA.—The Reading Knob Works is having plans drawn for the erection of a foundry extension to cost about $35,000.

NORMAN, Tenn.—The plant of the Wapakoneta Wheel Co. recently was damaged by fire.

ALTAVISTA, Va.—Lockwood, Greene & Co., Boston, have asked for bids on the construction of a boiler house for the Lane Co., Inc. The boiler house will house two 300-horsepower boilers.

NEWPORT NEWS, VA.—The Chesepeake

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	nominal
Algerian low phosphorus, 52 to 54 per cent	nominal
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	9.50 to 10.50
Spanish foundry or basic, 50 to 54 per cent	9.00 to 10.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganesese contained.

Brazilian, minimum 47 per cent ..... 40 cents c.i.f. tidewater

Indian, minimum 47 per cent ..... 40 cents c.i.f. tidewater

Caucasian, 53 to 55 per cent ..... 45½ cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton	$21.50

Rivets

Structural rivets, Pittsburgh	3.25c
Boiler rivets, Pittsburgh	3.35c
Rivets, 7/16-in. and smaller	60 and 5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.00 off list
Hot pressed square or hexagon tapped	$2.75 off list
Cold punched square or hexagon blank	$3.00 off ilst
Cold punched, square or hexagon, tapped	$2.75 off list
Cold punched semifinished hexagon nuts ½-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	45 off
Cut thread	40 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50 off
Cut thread	40-10 off
Larger and longer	40-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	35-5 off
Larger and longer	35-5 off
Lag screws	50 off
Plow bolts Nos. 1, 2 and 3 heads	40-10 off
4 to 10 heads	40-10-+20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot-pressed nuts	40-10 off
Bolt ends with cold punched nuts	35-5 off
Blank bolts	40 off
Rough stud bolts with nuts	40 off

WASHERS

Wrought washers ....$5.00 to $5.25 off list

Steel Pipe

(First column*—effective March 19, 1923)
(Second column—effective April 19, 1923)
*Wheeling Steel Corp. discounts.
Pittsburgh basing discounts, jobbers' carloads.

	Butt Weld Black	Galvanized
⅛-inch	44 to 45	18½ to 19½
¼ and ⅜-inch	50 to 51	24½ to 25½
½-inch	55 to 56	41½ to 42½
¾-inch	59 to 60	47½ to 48½
1 to 3-inch	61 to 62	49½ to 50½
Lap Weld		
2-inch	54 to 55	42½ to 43½
2½ to 6-inch	58 to 59	46½ to 47½
7 to 8-inch	55 to 56	42½ to 43½
9 and 10-inch	54 to 54	41½ to 41½
11 and 12-inch	54 to 53	41½ to 40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	59 to 60	47½ to 48½
Lap Weld		
2-inch	52 to 53	40½ to 41½
2½ to 6-inch	56 to 57	44½ to 45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	40 to 41	23½ to 24½
¼ and ⅜-inch	46 to 47	29½ to 30½
½-inch	52 to 53	41½ to 42½
¾-inch	57 to 58	46½ to 47½
1 to 1½-inch	59 to 60	48½ to 49½
2 to 3-inch	60 to 61	49½ to 50½
Lap Weld		
2-inch	52 to 53	41½ to 42½
2½ to 4-inch	56 to 57	45½ to 46½
4½ to 6-inch	55 to 56	44½ to 45½
7 to 8-inch	51 to 52	38½ to 39½
9 and 10-inch	45 to 45	32½ to 32½
11 and 12-inch	45 to 44	32½ to 31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	41 to 42	31½ to 32½
¾ to 1¼-inch	44 to 45	34½ to 35½
2 to 2½-inch	46 to 47	36½ to 37½
Lap Weld		
2-inch	40 to 41	31½ to 32½
2½ to 4-inch	42 to 43	33½ to 34½
4½ to 6-inch	41 to 42	32½ to 33½
7 to 8-inch	37 to 38	24½ to 25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbe s. carloads

THREADS AND COUPLINGS

	Butt Weld Black	Galvanized
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

	Butt Weld	
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

	Butt Weld	
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)

(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ... ...

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	80 off

Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES

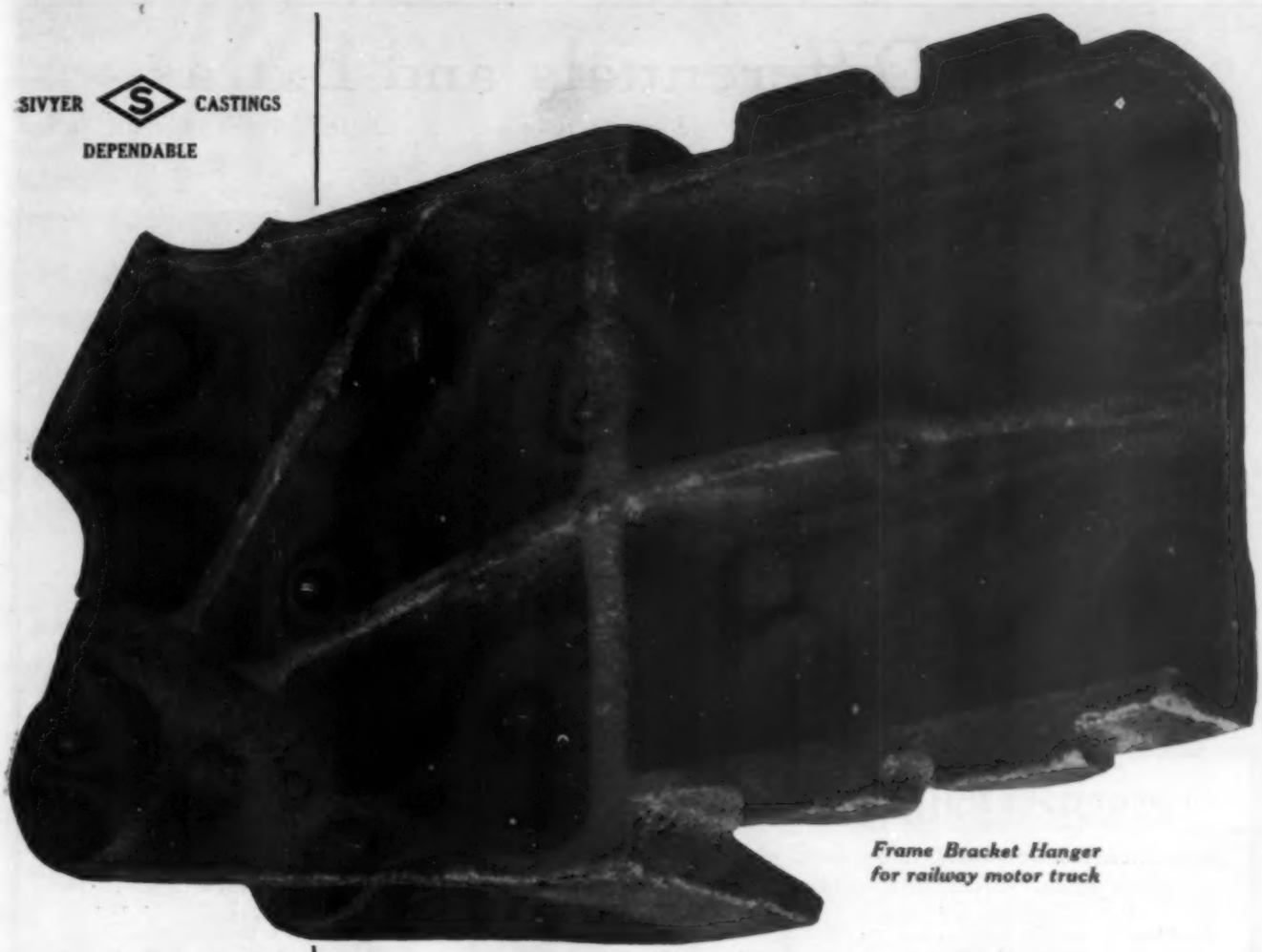
(Effective April 19, 1923)

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅛-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

SIVYER S CASTINGS
DEPENDABLE



Frame Bracket Hanger for railway motor truck

Proving Interior Integrity

THE result of the great advances of method in casting steel, that have been made during the last ten years, are well illustrated by castings like that shown here. Although the sections vary sharply from one-fourth to three-fourths of an inch, the castings are uniformly free from interior defects. In addition the toughness and close-grained structure of Sivyer Steel provide an unusual strength and endurance that in many designs make them preferable to forgings, because they give the engineer a greater freedom of design.

Send Blue Prints

A number of aggressive manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically, or at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel.

The last class includes especially castings with thin and sharply varying sections, and castings that have to be true to pattern, clean and smooth in order to fit the assembly with the minimum of finishing.

With Sivyer Electric Steel we have been able to show certain engineers very decided advantages and economies, not only as against ordinary steel castings and hammered forgings, but also as against malleable castings and fabricated steel.

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Sheet Differentials and Extras

Galvanized Sheets

Gage	Price per 100 pounds
30	add 50c
29	add 25c
28	(Carload quantities) Base
27	deduct 15c
25-26	deduct 30c
22-24	deduct 45c
17-21	deduct 60c
15-16	deduct 75c
12-14	deduct 90c
10-11	deduct $1.00

STANDARD SIZES

Gages Nos. 12 to 30, inclusive, 24, 26, 28, 30 and 36 inches wide, by 72, 84, 96 and 120 inches long.

EXTRAS FOR WIDTH

Gages	Width	Extra per 100 pounds
10 to 15	over 32 to 40 in.	None
	over 40 to 44 in.	10c
	over 44 to 48 in.	20c
16 to 18	over 32 to 36 in.	None
	over 36 to 44 in.	10c
	over 44 to 48 in.	20c
19 to 21	over 32 to 36 in.	None
	over 36 to 40 in.	20c
	over 40 to 44 in.	30c
	over 44 to 48 in.	40c
22 to 24	over 32 to 36 in.	None
	over 36 to 40 in.	20c
	over 40 to 44 in.	40c
	over 44 to 48 in.	60c
25 to 26	over 32 to 36 in.	None
	over 36 to 40 in.	30c
	over 40 to 44 in.	60c
27	over 32 to 36 in.	10c
	over 36 to 40 in.	50c
	over 40 to 44 in.	75c
28	over 32 to 36 in.	20c
	over 36 to 40 in.	60c
29 to 30	over 32 to 36 in.	20c
24 and heavier	under 24 to 12 in.	15c
	under 12 to 9 in.	25c

EXTRAS FOR WIDTH (Continued)

25 and lighter	under 24 to 12 in.	20c
	under 12 to 9 in.	35c

EXTRAS FOR LENGTH

Gage	Length	Extra per 100 pounds
16 and heavier	60 to 144 in.	None
16 and heavier	under 60 to 30 in.	5c
16 and heavier	under 60 to 30 in.	10c
17 to 18	over 60 to 120 in.	None
17 to 18	over 120 to 132 in.	5c
17 to 18	over 132 to 144 in.	10c
17 to 18	under 60 to 30 in.	5c
17 to 18	under 30 to 18 in.	10c
19 and lighter	over 60 to 120 in.	None
19 and lighter	over 120 to 144 in.	10c
19 and lighter	under 60 to 30 in.	10c
19 and lighter	under 30 to 18 in.	20c

Blue Annealed Sheets

Gage	Price per 100 pounds
8 and heavier	Less 5c
9 and 10	(Carload quantities) None
11 and 12	add 5c
13 and 14	add 10c
15 and 16	add 20c

STANDARD SIZES

Widths 24-26-28-30-36 and 48 inches.
Lengths 72-84-96-120 and 144 inches.

EXTRAS FOR WIDTH

Gage	Width	100 pounds
16 and heavier	under 24 to 12 in.	add 5c
16 and heavier	under 12 to 6 in.	add 10c
16 and heavier	24 in. and wider.	None

EXTRAS FOR LENGTH

Gage	Length	Extra per 100 pounds
16 and heavier	60 in. and longer.	None
16 and heavier	under 60 to 30 in.	add 5c
16 and heavier	under 30 to 18 in.	add 10c

Black Sheets

Gage	Per 100 pounds
30	add 20c
29	add 10c
28 (carload quantities)	Base
27	deduct 5c

BLACK SHEETS (Continued)

25-26	deduct 10c
22-24	deduct 15c
17-21	deduct 20c
15-16	deduct 25c
13-14	deduct 30c
10-12	deduct 35c

STANDARD SIZES

Gages Nos. 12 to 30, inclusive, 24, 26, 28 and 30 inches wide, by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28, inclusive, in addition to the foregoing, 36 inches wide by 96 inches and 120 inches long.

EXTRAS FOR WIDTH

Gage	Width	Extra per 100 pounds
16 and heavier	24 and wider	None
16 and heavier	under 24 to 12 in.	10c
16 ton heavier	under 12 to 6 in.	15c
17 to 18	over 24 to 36 in.	None
17 to 18	over 24 to 48 in.	5c
17 to 18	under 24 to 12 in.	10c
17 to 18	under 12 to 6 in.	15c
19 and lighter	under 24 to 12 in.	10c
19 and lighter	under 12 to 6 in.	20c
19 to 21	over 24 to 36 in.	None
19 to 21	over 36 to 44 in.	15c
19 to 21	over 44 to 48 in.	25c
22 to 24	over 24 to 36 in.	None
22 to 24	over 36 to 40 in.	20c
22 to 24	over 40 to 48 in.	40c
25 to 27	over 24 to 36 in.	None
25 to 27	over 36 to 40 in.	20c
25 to 27	over 40 to 44 in.	40c
28	over 32 to 36 in.	10c
29 to 30	over 32 to 36 in.	10c
28	over 36 to 40 in.	40c

EXTRAS FOR LENGTH

Gage	Length	Extra per 100 pounds
16 and heavier	60 and longer	None
16 and heavier	under 60 to 30 in.	5c
16 and heavier	under 30 to 18 in.	10c
17 to 18	over 60 to 120 in.	None
17 to 18	over 120 to 132 in.	5c
17 to 18	over 132 to 144 in.	10c
17 to 18	under 60 to 30 in.	5c
17 to 18	under 30 to 18 in.	10c
19 and lighter	over 60 to 120 in.	None
19 and lighter	over 120 to 144 in.	10c
19 and lighter	under 60 to 30 in.	10c
19 and lighter	under 30 to 18 in.	20c

& Ohio railroad will expend approximately $4,000,000 on terminal improvements here.

FOND DU LAC, WIS.—The Combination Door & Screen Co. 180 Ruggles street, plans the erection of a 3-story factory building to be built at an estimated cost of $25,000.

GREEN BAY, WIS.—A 1-story machine shop addition, 53 x 100 feet, will be built by the A. Libert Machine Co., at 324 North Roosevelt street.

HARTFORD, WIS.—The board of public works accepted the bid of Fred H. Dorner, 548 Milwaukee street, Milwaukee, for furnishing a steam turbine pump, made by the Standard Turbine Corp., Wellsville, N. Y.

LA CROSSE, WIS.—The board of public works is taking bids for the La Crosse vocational school, two stories, 142 x 206 feet, costing $150,000.

MENASHA, WIS.—Articles of incorporation have been filed by the Gilbert & Nash Co., which will manufacture and deal in machinery, appliances, mechanical equipment and accessories. W. M. Gilbert, a large paper mill operator, and Will C. Nash and George D. Barnes are the incorporators.

MILWAUKEE—The Hackman Mfg. Co. has been incorporated with $25,000 capital to manufacture and repair machinery. The incorporators are W. C. Hackman, R. J. Bruss and H. C. Tank.

NEENAH, WIS.—Engineers Cahill & Douglas, 217 West Water street, Milwaukee, are taking bids for furnishing four 400-horsepower watertube boilers for the power house of the Valley Paper Mills, Inc., at Neenah.

WOODVILLE, WIS.—Bids are being taken until May 14 by John Vrieze, village president, for the construction and equipment of a water works system.

RIVERSIDE IOWA.—The Sioux City Brick & Tile Co. contemplated the erection of a clay products plant to be built at an estimated cost of $100,000.

Business in Canada

NORTH VANCOUVER, B. C.—Plans for a pulp and paper mill here are being completed by the Seamen Paper Co., of Chicago. The mill will be erected on land near the city owned by R. J. Young of Madison, Wis.

VANCOUVER, B. C.—It is stated the Morrison Mill Co., of Blaine, Wash., is preparing to remove its plant to this district.

BELLEVILLE, ONT.—The Springer Lock Mfg. Co. will build an addition to its plant in which equipment will be installed for plating department. W. C. Springer is president.

HAMILTON, ONT.—The Wingham Wire Co. is building an addition to its plant and will install machinery and equipment to cost about $50,000 for the manufacture of plow steel, patent crucible steel, and spring wire. Furnaces will be installed.

NEW TORONTO, ONT.—The Reg. N. Boxer Co. will erect a $100,000 addition to its plant here.

OCEAN FALLS, B. C.—The Pacific Mills, Ltd., propose to spend $300,000 on additions and improvements to its plant including the erection of a digester building.

PENNY, B. C.—T. B. Wall proposes to build a sawmill here to have a capacity of 25,000 feet.

SETON, B. C.—The Bridge River Power Co., is having plans prepared for a power development undertaking to cost $12,000,000, including gravity dam, power house and transmission line. H. Holgate is engineer

WEST KOOTENAY, B. C.—The West Kootenay Power Co. has made application to the provincial government for permission to double the capacity of its main power plant at Bonningston Falls

BROCKVILLE, ONT.—The plant of the Gilbert Boat Co. recently was damaged by fire.

CLIFFORD, ONT.—The town council

(*Concluded on Page* 1348)

A general view of our Open Hearth Floor showing charging end of furnaces

Quality Sheets

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS

PICKLED and ANNEALED ENAMELING STOCK

For Vitreous Enameling

STOVE PIPE STOCK and ELBOW STOCK

Uniform Color Blue

MILK CAN STOCK

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MANSFIELD SHEET & TIN PLATE COMPANY

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., No. 2 Rector St., New York, N. Y.
Mr. D. B. Cory, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1201 National Bank Building, Cleveland, O.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cincinnati, O.
Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.
Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

Iron and Steel Scrap Prices.

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$17.00 to 18.00
Boston (dealers)	$17.00 to 18.00
Buffalo	24.50
Chicago	21.50 to 22.00
Cleveland	23.00 to 23.25
Cincinnati	21.50 to 22.00
Detroit (dealers)	21.50 to 22.00
Eastern Pennsylvania	21.50 to 22.50
New York (dealers)	17.00 to 17.50
Pittsburgh	23.00 to 23.50
St. Louis	19.50 to 20.00
Valleys (nominal)	25.25 to 25.50
No. 1 railroad steel New York (dealers)	17.50 to 18.00

BUNDLED SHEETS

Buffalo	$16.25 to 16.75
Cleveland	16.50 to 16.75
Cincinnati	16.50 to 17.00
Detroit	13.00 to 13.50
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.00 to 21.50
St. Louis	15.50 to 16.00
Valleys	20.00 to 20.50

STEEL RAILS, SHORT

Birmingham	$19.00 to 20.00
Boston (dealers)	19.50 to 20.00
Chicago	24.25 to 24.75
Cincinnati	25.00 to 26.00
Cleveland	21.75 to 22.25
St. Louis	22.50 to 23.00

STOVE PLATE

Birmingham	$19.00 to 20.00
Boston	19.50 to 20.50
Buffalo	21.00 to 22.00
Chicago	22.25 to 22.75
Cincinnati (net ton)	17.50 to 18.00
Cleveland	23.00 to 23.50
Detroit (net ton) (dealers)	18.50 to 19.00
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	16.50 to 17.00
Pittsburgh	19.50 to 20.00
St. Louis	20.00 to 20.50

LOW PHOSPHORUS

Buffalo	28.00 to 29.00
Cincinnati	21.50 to 22.00
Eastern Pennsylvania	29.00 to 30.00
Pitts. billet and bloom crops	30.50 to 31.00

SHOVELING STEEL

Chicago	21.00 to 21.50
Pittsburgh	20.00 to 20.50
St. Louis	18.50 to 19.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	27.00 to 27.50
Eastern Pennsylvania	27.00 to 29.00
Pittsburgh	27.50 to 28.00
St. Louis	26.00 to 26.50

COMPRESSED SHEETS

Buffalo	$22.00 to 22.50
Chicago	20.00 to 20.50
Pittsburgh	22.00 to 22.50
Cleveland	21.25 to 21.75
Detroit (dealers)	20.00 to 20.50
Valleys (nominal)	23.75 to 24.00

FROGS, SWITCHES, GUARDS

Chicago	21.50 to 22.00
Eastern Pennsylvania	21.50 to 22.50
St. Louis	20.50 to 21.00

BOILER PLATE, CUT

St. Louis (dealers)	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	23.50 to 24.00
St. Louis	21.00 to 21.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	19.50 to 20.00
Boston (dealers)	22.00 to 23.00
Buffalo	21.00 to 21.50
Chicago, No. 1	22.00 to 22.50
Chicago, No. 2	21.50 to 22.00
Cincinnati No. 1	18.00 to 19.00
Cleveland No. 1	20.50 to 21.00
Eastern Pennsylvania, No. 1	25.00 to 26.00
Pittsburgh No. 1	24.50 to 25.00
Pittsburgh No. 2	23.00 to 23.50
New York, No. 1 (dealers)	20.75 to 21.25
St. Louis No. 1	20.50 to 21.00
St. Louis No. 2	19.50 to 20.00

WROUGHT PIPE

Boston (dealers)	14.00 to 14.50
Buffalo	18.50 to 19.00
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	14.00 to 14.50

YARD WROUGHT

Boston	19.00 to 19.50
Eastern Pennsylvania	23.50 to 24.50

CITY WROUGHT

New York, long	$18.00 to 18.50

BUSHELING

Buffalo, No. 1	$21.50 to 22.00
Chicago, No. 1	20.00 to 20.50
Chicago, No. 2	15.00 to 15.50
Cincinnati No. 1	17.50 to 18.00
Cleveland, No. 1	17.00 to 17.25
Cleveland, No. 2	16.00 to 16.50
Detroit, No. 1	17.00 to 17.50
Detroit No. 2 (new)	14.00 to 15.00
Detroit, No. 2 (old)	13.00 to 14.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh, No. 1	21.00 to 21.50
St. Louis, No. 1	19.00 to 19.50

MACHINE SHOP TURNINGS

Birmingham	$14.00 to 14.50
Boston (dealers)	15.00 to 15.50
Buffalo	18.50 to 19.50
Chicago	15.00 to 15.50
Cleveland	18.25 to 18.50
Cincinnati (net ton)	14.50 to 15.00
Detroit (dealers)	16.00 to 17.00
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	16.00 to 16.50
Pittsburgh	20.00 to 20.50
St. Louis	15.00 to 15.50
Valleys	20.00 to 20.25

CAST IRON BORINGS

Birmingham (chemical)	16.50 to 17.00
Birmingham borings (plain)	14.00 to 14.50
Boston (chemical)	19.00 to 19.50
Boston (dealers)	15.00 to 15.50
Buffalo	20.00 to 21.00
Chicago	17.25 to 17.75
Cincinnati (net ton)	15.50 to 16.00
Cleveland	18.75 to 19.00
Detroit (dealers)	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
Eastern Pennsylvania (chem.)	24.00 to 26.00
Pittsburgh	21.00 to 21.50
New York (dealers' price)	15.50 to 16.00
St. Louis	16.00 to 16.50
Valleys	20.00 to 20.50

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	15.00 to 15.50
Cleveland	18.00 to 18.25
Detroit (dealers)	16.00 to 16.50
Eastern Pennsylvania	17.00 to 19.00
New York (dealers)	14.00 to 14.50

IRON AXLES

Birmingham	$29.00 to 30.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00 to 31.00
Chicago	33.00 to 33.50
Cincinnati	29.00 to 30.00
Eastern Pennsylvania	35.00 to 38.00
New York (dealers)	29.00 to 30.00
Pittsburgh	39.00 to 39.50
St. Louis	31.00 to 31.50

IRON RAILS

Buffalo	$23.00 to 23.50
Chicago	23.75 to 24.75
Cincinnati	20.50 to 21.00
St. Louis	21.00 to 21.50

PIPES AND FLUES

Chicago	16.00 to 16.50
Cincinnati	15.00 to 15.50
Cleveland	17.00 to 17.50
St. Louis	14.50 to 15.00

RAILROAD GRATE BARS

Buffalo	$22.00 to 23.00
Chicago	22.00 to 22.50
Cleveland	23.00 to 23.50
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	18.50 to 19.00
St. Louis	20.50 to 21.00

FORGE FLASHINGS

Boston (dealers)	14.50 to 15.00
Chicago, small	17.50 to 18.00
Cleveland, small	20.00 to 20.25
Cleveland, large	20.00 to 20.25
Detroit (dealers)	16.50 to 17.00

FORGE SCRAP

Boston (dealers)	14.50 to 15.00
Chicago	21.50 to 22.00
Eastern Pennsylvania	19.50 to 20.50

ARCH BARS AND TRANSOMS

Chicago	28.00 to 28.50
St. Louis	26.50 to 27.00

ANGLE BARS—IRON

Chicago	27.50 to 28.00
St. Louis	25.50 to 26.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	15.50 to 16.00
Buffalo	23.00 to 24.00
Chicago	18.50 to 19.00
Cleveland	20.00 to 21.00
Eastern Pennsylvania	20.00 to 20.50
Pittsburgh	22.50 to 23.00
St. Louis	17.00 to 17.50

STEEL CAR AXLES

Birmingham	$25.00 to 27.00
Boston (consumers)	27.00 to 28.00
Buffalo	24.50 to 25.50
Chicago	26.50 to 27.00
Cleveland	31.00 to 32.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	22.00 to 23.00
Pittsburgh	27.50 to 28.00
St. Louis	26.50 to 27.00

SHAFTING

Boston (consumers)	27.00 to 28.00
Chicago	26.00 to 26.50
Eastern Pennsylvania	26.00 to 28.00
New York (dealers)	24.00 to 25.50
St. Louis	24.00 to 24.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	$23.00 to 24.00
Birmingham iron	22.00 to 22.50
Boston (consumers)	26.00 to 27.00
Buffalo, iron	24.00 to 24.50
Chicago, iron	25.50 to 26.00
Cincinnati	20.50 to 21.00
Eastern Pennsylvania	26.00 to 27.00
New York iron (dealers)	22.50 to 23.50
Pittsburgh, iron	27.00 to 27.50
Pittsburgh, steel	27.50 to 28.00
St. Louis, iron	24.50 to 25.00

NO. 1 CAST SCRAP

Birmingham, cupola	$24.00 to 24.50
Boston (consumers)	28.00 to 29.00
Buffalo	25.50 to 26.50
Chicago, cupola	25.50 to 26.00
Cincinnati, No. 1, machinery, cupola (net ton)	24.00 to 24.50
Cleveland, cupola	28.00 to 28.50
Detroit (net ton) (dealers)	24.50 to 25.50
Eastern Pennsylvania, cupola	25.00 to 27.00
New York, cupola (dealers)	22.00 to 22.50
Pittsburgh, cupola	27.00 to 27.50
San Francisco	26.00 to 28.00
St. Louis, agricultural	24.00 to 24.50
St. Louis, railroad	24.50 to 25.00
Valleys	25.00 to 26.00

HEAVY CAST

Boston (consumers)	26.00 to 27.00
Buffalo	21.50 to 22.00
Cleveland	20.50 to 21.00
Detroit automobile (net ton)	27.00 to 28.00
Eastern Pennsylvania	21.00 to 23.00
New York (dealers)	21.00 to 21.50
Pittsburgh	24.00 to 24.50

MALLEABLE

Boston (railroad) (consumers)	26.00 to 27.00
Buffalo	27.00 to 28.50
Chicago, railroad	27.00 to 27.50
Chicago, agricultural	25.50 to 26.00
Cincinnati, agricultural	22.50 to 23.00
Cincinnati, railroad	23.50 to 24.00
Cleveland, agricultural	27.00 to 28.00
Cleveland, railroad, nominal	28.50 to 29.00
Detroit (dealers)	24.00 to 25.50
Eastern Pennsylvania, railroad	22.00 to 23.00
Pittsburgh, railroad	26.00 to 26.50
St. Louis, agricultural	24.00 to 24.50
St. Louis, railroad	24.00 to 25.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00 to 22.00
Boston (dealers)	19.50 to 20.00
Chicago	23.00 to 23.50
Cleveland	25.00 to 25.75
Eastern Pennsylvania	25.00 to 26.00
New York (dealers)	20.00 to 20.50
Pittsburgh district	27.00 to 27.50
St. Louis	21.50 to 22.00

LOCOMOTIVE TIRES

Chicago	24.50 to 25.00
St. Louis	23.00 to 23.50

LOW PHOSPHORUS PUNCHINGS

Chicago	24.50 to 25.00
Eastern Pennsylvania	26.00 to 28.00
Pittsburgh	28.00 to 28.50

LOGEMANN

Double Ram Hydraulic

Scrap-Metal Presses

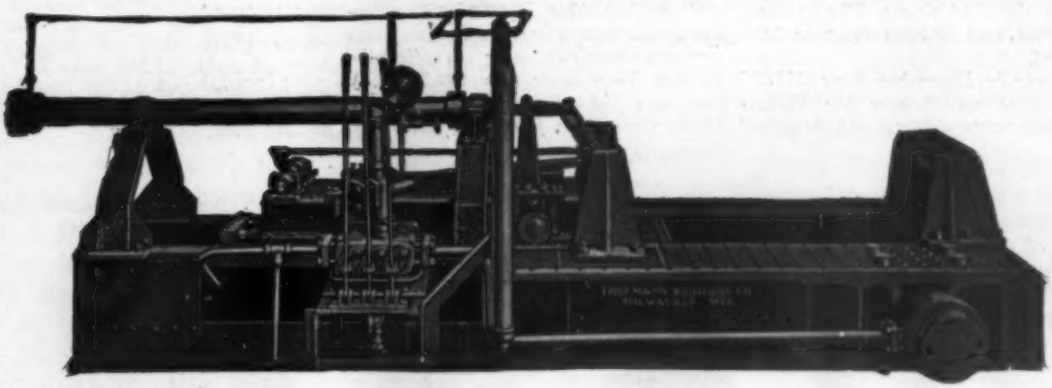
STANDARD

In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

Business in Canada

(*Concluded from Page* 1344)

plants to erect an electric light plant and is interested in information and prices.

DURHAM, ONT.—The town council plans a waterworks plant and system at a cost of $100,000

HAMILTON, ONT.—J. A. Doige, 261 Ottawa street north, will erect a factory for the manufacture of cement blocks, etc.

MIMICO., ONT.—W. J. Miller, 93 Yonge street, Toronto, Ont., is preparing plans for a factory here at a cost of $30,000 for W. E. Shenstone, London, England.

ORANGEVILLE, ONT.—The Engineering & Radio Supplies, Ltd., has taken over the plant of the Cataract Electric Co., and that of the Industrial Engineering Co. of Canada. The company will build an addition and install equipment to the plant of the Cataract Electric Co, at Cataract, Ont.

TORONTO, ONT.—Electropax, Ltd., has been incorporated with $200,000 capital stock by Ivan C. Harries, I. M. Johnson and Frederick C. L. Jones.

TORONTO, ONT.—The Zenith Oil Heaters Ltd., has been incorporated to manufacture oil heaters, etc., with $40,000 capital stock by Harry C. Moore, Robert E. Duffy and Walter A. McConnell.

TORONTO, ONT.—The Brooks Steam Motors, Ltd., has been incorporated to manufacture automobiles, etc., with $5,000,000 capital stock by Morley P. Vandervoort, Thomas J. Gallivan and Edward L. Reilly.

TORONTO, ONT.—Burndept of Canada, Ltd., has been incorporated to manufacture radio and wireless equipment, etc., with $40,000 capital stock by Ernest E. Cherry, Frederick L. Simons and M. Z. Warren.

TORONTO, ONT.—The Bell Telephone Co. of Canada will spend $13,000,000 on new plants and equipment in Toronto and Montreal. A new building will be erected on Ontario street, Montreal, to cost $4,000,000. The company will also start work at once on a building at Adelaide and Shepard streets, Toronto.

WINDSOR, ONT.—The Barnes Mfg. Co., Detroit, manufacturers of scales, etc., has leased a building at 325 Assumption street, here, which will be equipped for an assembling plant.

WINDSOR, ONT.—The Windsor Piston Ring Co., Ltd., has been incorporated to manufacture motors, engines, piston rings, parts, accessories, etc., with $40,000 capital stock; by Harry McGhee, Max Grabowsky, both of Detroit; James L. Reaume, of Windsor, Ont., and others.

WINDSOR, ONT.—The S. & M. Tool Co., Ltd., has been incorporated to manufacture tools, machinery, boilers, iron, steel and metal products, etc., with $40,000 capital stock; by Samuel C. Staley, of Sandwich, Ont.; Oscar Sweetman, George E. Manning and others, of Windsor.

MONTREAL, QUE.—The Walnut Furniture Mfg. Co., Ltd., has been incorporated to manufacture furniture, wood products, etc., with $50,000 capital stock; by Lazarus Phillips, Benjamin Robinson, Abraham S. Cohen and others.

MONTREAL, QUE.—The Foss Machinery, Ltd., has been incorporated to manufacture machinery, tools, boilers, implements, etc., with $100,000 capital stock; by Felix W. Hackett, George B. Foster, both of Montreal; John T. Hackett, of Westmount, Que., and others.

MONTREAL, QUE.—William J. Michaud Co., Ltd., has been incorporated to manufacture and deal in iron, steel, metals, tools, machinery, etc., with $60,000 capital stock; by Jacob DeWitt, Wilbert H. Howard, Joseph J. Harold and others.

MONTREAL, QUE.—The National Cement Co., recently incorporated with $4,000,000 capital stock has purchased a site and called for bids recently for a large plant here, construction work on which will be started about May 1. Louis Hurtibise, room 300, 90 St. James street, is chief engineer.

SOREL, QUE.—The Richelieu Engineering Co., Ltd., has been incorporated to carry on business as iron and steel converters, to manufacture rolling stock, tools, implements, etc., with $200,000 capital stock; by Joseph O. Pouliot, Joseph A. Simard, Edward Barnard and others.

German Exports of Iron and Steel—1922

BERLIN, April 19.—*Germany's exports of iron and steel products in* 1922, *according to government statistics compiled recently, were* 2,628 240 *metric tons compared with* 2,145,000 *tons in* 1921. 1,750,601 *tons in* 1920, *and* 5,-755,600 *tons in* 1913. *The figures for* 1921 *are partially estimated since official statistics covering the first four months have not been issued. The exports last year were* 46 *per cent of the* 1913 *figure. The increase over* 1921 *was* 482,000 *tons or* 22½ *per cent.*

Exports in December were 263,035 *metric tons, which was the highest since the war. Among the principal items exported in December were* 44,261 *tons of bars and bands,* 25,-905 *tons of rails,* 20,137 *tons of wire* 28,321 *tons of plates and sheets,* 21,-332 *tons of semifinished steel and* 13,004 *tons of pig iron. The exports in detail for each month throughout the year are given in the accompanying table.*

Imports in 1922 *were* 2,432,993 *metric tons compared with* 632,000 *tons in* 1921, 419,406 *tons in* 1920 *and* 289,000 *tons in* 1913. *The imports last year were far heavier than in any previous year in German history. They were only* 194,247 *tons less than the exports. On a tonnage basis, Germany's iron and steel foreign trade last year was practically balanced. This was due to the heavy increase in imports during the latter months of the year culminating with* 296 301 *tons in October. The imports in December were* 243,128 *tons.*

Figures also have just been issued for January showing exports of 214,450 *tons. This is the smallest since August and partially reflects the affect of the occupation of the Ruhr. Among the principal exports in January were* 38 302 *tons of bars and bands* 30,746 *tons of plates and sheets* 17,567 *tons of wire,* 13,819 *tons of rails,* 13,256 *tons of semi-finished steel and* 12,450 *tons of pig iron. The imports in January totaled* 194 312 *tons.*

In Metric Tons of 2205 Pounds

	First Quarter	Second Quarter	July	August	September	October	November	December
Pig Iron, ferro alloys and scrap	61,698	43,519	11,519	21,781	22,512	38,659	32,167	17,290
Cast Iron Pipe	8,345	13,584	5,006	2,562	4,916	4,176	5,949	4,696
Rolls	4,920	1,913	882	1,039	840	945	815	1,200
Cast Machine Parts	2,021	1,255	152	265	100	286	184	10,281
Other Castings	20,060	40,917	8,730	7,195	7,908	9,179	7,931	
Blooms, billets, sheet bars	9,841	8,853	8,848	9,840	17,240	12,484	13,678	21,332
Bars and bands	139,263	112,609	38,981	39,796	48,689	43,765	42,718	44,261
Plates and sheets	58,349	60,739	18,881	14,425	21,462	21,767	19,230	28,321
Tinplate and galvasheets	7,686	6,872	2,342	1,412	1,984	1,702	1,856	2,695
Wire, rolled and drawn	35,123	40,759	13,278	14,671	16,792	16,254	16,497	20,137
Pipe	30,726	41,560	9,329	6,338	14,717	8,553	9,389	14,756
Rails and track fastenings	77,183	91,105	30,081	30,550	32,812	33,569	31,309	29,107
Wheels and tires	11,692	13,584	6,736	5,525	4,189	4,400	3,911	4,047
Forgings	31,028	33,940	12,850	9,891	10,870	10,975	10,691	.....
Bridge and structural steel	13,728	14,896	5,136	2,954	3,072	3,348	3,160	3,940
Boilers	5,668	7,977	3,398	2,933	2,393	4,346	2,865	2,229
Anchors, hammers, etc	1,560	1,496	536	425	455	501	482	.....
Agricultural implements	9,235	9,718	3,622	3,022	3,461	2,753	2,161	.....
Tools	9,670	10,624	3,806	3,395	3,363	3,838	3,241	.....
Screws, bolts, nuts, etc	8,491	8,343	2,347	1,974	2,280	2,070	1,945	2,297
Axles	694	1,037	229	202	253	211	313	.....
Railway and auto springs	324	1,769	807	419	836	628	730	.....
Wire rope	14,278	2,742	979	1,138	1,544	1,148	1,179	1,264
Other wire products	2,036	16,147	4,610	3,498	4,714	4,355	6,124	7,193
Wire nails	13,083	17,430	5,599	4,266	6,571	5,891	6,129	7,659
House hardware	10,069	13,175	3,285	2,480	3,229	3,262	2,626	.....
Chain	1,776	1,829	786	634	576	430	394	.....
Miscellaneous	19,117	27,185	9,571	5,778	6,234	6,579	5,879	40,330
	606,432	623,329	212,397	198,408	244,012	246,074	234,553	263,035

GRAND TOTAL for 1922: 2,628,240